

**DESIGN-BUILD CONTRACT  
DIA DATA CENTER**

This Design-Build Contract, is made and entered into as of the date set forth on the signature page, below, by and between the **CITY AND COUNTY OF DENVER**, a municipal corporation of the State of Colorado, hereinafter referred to as the "CITY", and **PCL CONSTRUCTION SERVICES, INC.**, a Colorado corporation, hereinafter referred to as the "CONTRACTOR".

**WITNESSETH**

**WHEREAS**, the City has implemented and completed a competitive selection process and has selected a Contractor to design, construct, install and deliver to the City the facilities for the DIA Data Center (the "Project"); and

**WHEREAS**, the City is relying upon the qualifications presented in the Contractor's response to the Request for Proposals dated September 25, 2012, to develop the design and perform the construction of the Project in entering into this Design-Build Contract; and

**WHEREAS**, the Contractor was selected after a determination that its response, was the most advantageous to the City; and

**WHEREAS**, the Project's Design-Build Criteria and Scope of Work is attached hereto and incorporated herein as ***Exhibit A***; and

**WHEREAS**, the Contractor warrants and represents that it is ready, willing and able to design, build and deliver a fully functional and approved (per all applicable laws, building codes and other standards set forth in the Contract Documents) Project in accordance with the terms and conditions of this Design-Build Contract and as hereinafter set forth.

**NOW THEREFORE**, in consideration of the mutual promises and covenants contained herein, the Parties agree as follows:

**1. AUTHORITY**

**1.1 Line of Authority** The City's Manager of Aviation, her designee or successor in function (hereinafter referred to as the "Manager") authorizes all work performed under this Design-Build Contract. The Manager hereby delegates her authority over the work described herein to the Deputy Manager of Aviation/Planning and Development as the Manager's authorized representative for the purpose of overseeing the work under this Design-Build Contract. The Manager's authorized representative for the day-to-day administration of the Contractor's services under this Design-Build Contract is the Project Manager. The Contractor shall submit its reports, memoranda, correspondence and submittals to the Project Manager. The Manager may rescind or amend any such designation of representatives or delegation of authority and the Manager may, from time to time, designate a different Project Manager, upon written notice to the Contractor.

**1.2 Limitation on Delegation of Authority** It is expressly understood that although the Project Manager may gather information about proposed changes in the contract time and contract price from the Contractor, only the Manager or his designated representative has the authority to legally bind the City to changes in contract time and contract price through a validly executed change order in accordance with the General Conditions.

## **2. CONTRACTOR**

**2.1 Contractor Selection.** In accordance with the requirements of Section 20-56 of the Denver Revised Municipal Code (the “DRMC”), the City implemented and completed a competitive selection process to identify qualified contractors to perform both design and construction services for the Project. The Contractor was selected to perform such services for the City as set forth in the City’s Request for Proposals (RFP) and the Contractor’s RFP Submittal. *In referencing these solicitations and submissions herein, the City and the Contractor acknowledge that the scope of the Project, as presented and addressed by these documents, may have materially evolved since the issuance of these documents and that some information presented may not be applicable to this Design-Build Contract or the Project.*

**2.2 General.** The Contractor shall provide and furnish all services and work items necessary to perform the Work for the Project as defined in the Design-Build Criteria and Scope and all other terms and conditions of this Design-Build Contract, including but not limited to the following: all professional services, materials, parts, labor, supervision, coordination, administration, equipment, tools, temporary utilities, shop drawings, studies, reports, permitting documents, schematic drawings, specifications, design development drawings, construction drawings, as-built drawings and incidentals required by the Contract Documents and desirable for the full completion of the Work and Project, described, or specified in this Design-Build Contract. The terms “Project” and “Work” are synonymous. The Contractor’s Project cost proposal shall include all costs relating to, or associated with, the foregoing, including, but not limited to, material costs, equipment costs, personnel costs, overhead and profit and all other costs associated with the Contractor’s performance, including all of the Contractor’s errors, omissions and negligence with respect to such performance.

**2.3 Relationship of the Parties.** By entering into this Design-Build Contract, the Contractor accepts the relationship of trust and confidence between it and the City. The Contractor shall furnish its reasonable professional skill and judgment and shall cooperate with the officials, employees and agents of the City, including the Project Manager, in furthering the interests of the City. The Contractor will furnish efficient business administration and superintendence and will use reasonable efforts to perform the Work in an expeditious and economical manner consistent with the interests of the City. In no event shall the Contractor be considered a fiduciary of the City by reason of this paragraph.

## **2.4 Development of Program**

**2.4.1** Contractor shall assist the City in the development and preparation of the Project, which shall outline the objectives and requirements of the City with respect to the Project. This shall

include budget and time criteria, space requirements, special equipment and systems, and site requirements.

**2.4.2** Contractor shall ascertain City's requirements for the Project and shall verify and review such requirements with the City. Contractor's review shall also provide to the City a preliminary evaluation of the Site with regard to access, traffic, drainage, parking, building placement and other considerations affecting the building, as well as information regarding applicable government laws, regulations and requirements. Contractor shall also propose architectural, civil, structural, mechanical, electrical and other systems for review by the City.

**2.4.4** The contractual obligations of such professional persons or entities are undertaken and performed in the interest of the Contractor. Contractor shall be responsible to the City for acts and omissions of Contractor's employees, subcontractors and their agents and employees, and other persons, including the design professionals, performing any portion of Contractor's obligations under this Agreement.

**2.4.5** Contractor shall provide a written program of the requirements for City's approval.

## **2.5 Design/Preconstruction Services**

**2.5.1 Design Documents**. The Contractor shall prepare or provide to the Project Manager for review and approval the Approved Design Documents and detailed specifications, including but not limited to those items set forth in *Exhibit A*. Design services shall be performed by qualified architects, engineers and other professionals selected and paid by the Contractor.

**2.5.2 Standard of Care for Professional Design Services**. The Contractor shall perform all services required by this Design-Build Contract with the degree of skill, care and diligence consistent with the professional standards prevailing in the Denver Metropolitan Area for services of comparable scope and magnitude. The Contractor's designer shall be licensed in the State of Colorado.

### **2.5.3 Ownership of Documents**

**2.5.3.1** The City shall have title and all intellectual and other property rights, in and to all phased and final documents and all data used in the development of the same, including the results of any tests, surveys or inspections at the Project site, and all photographs, drawings, drafts, contract documents, studies, estimates, reports, models, notes and any other materials or work products, whether in electronic or hard copy format, created by the Contractor pursuant to this Design-Build Contract, in preliminary and final forms and on any media whatsoever (collectively, the "Documents"), whether the Project for which the Documents were created is executed or not. The Contractor shall identify and disclose, as requested, all such Documents to the City.

To the extent permitted by the U.S. Copyright Act, 17 USC § 101 *et seq.*, as the same may be amended from time to time, the Documents are a "work made for hire," and all ownership of copyright in the Documents shall vest in the City at the time the Documents are created. To the extent that the Documents are not a "work made for hire," the Contractor hereby assigns and

transfers all right, title and interest in and to the Documents to the City, as of the time of the creation of the Documents, including the right to secure copyright, patent, trademark, and other intellectual property rights throughout the world and to have and to hold such copyright, patent, trademark, and other intellectual property rights in perpetuity.

**2.5.3.2** The Contractor shall provide (and cause its employees and subcontractors to provide) all assistance reasonably requested in securing for the City's benefit any patent, copyright, trademark, service mark, license, right or other evidence of ownership of such Documents, and shall provide full information regarding the Documents and execute all appropriate documentation in applying for or otherwise registering, in the City's name, all rights to such Documents.

**2.5.3.3** The Contractor agrees to allow the City to review any of the procedures used in performing the work and services hereunder, and to make available for inspection the field notes and other documents used in the preparation for and performance of any of the services performed hereunder.

**2.5.3.4** The Contractor shall be permitted to retain reproducible and electronic copies of all of the Documents for the information and reference, and the originals of all of the Documents, including all electronic files, shall be delivered to the City promptly upon completion thereof, or if authorized by the City's Project Manager, upon termination or expiration of this Design-Build Contract.

**2.6** **Construction Services.** Construction Services shall be performed by qualified Design-Build Contractors (licensed in the City and County of Denver), subcontractors and suppliers, selected and paid by the Contractor and acting in the interest of the Contractor. Selection of the Contractor's subcontractors, consultants, subconsultants, vendors and suppliers shall be at the sole discretion of the Contractor.

**2.7** **Acts and Omissions.** The Contractor shall be responsible to the City for negligent acts and omissions of the Contractor's employees, contractors, subcontractors, agents and parties in privity of contract with it to perform a portion of the Work, including all design elements of the Project.

**2.8** **Conflict of Interests.** No design consultant or subconsultant shall be engaged to perform work on the Project wherein a conflict exists, such as being connected with the sale or promotion of equipment or material which may be used in the Project, provided, however, that in unusual circumstances and with full disclosure to the City of such interest, the City may provide a waiver, in writing, in respect to the particular consultant or subconsultant.

### **3. CONTRACT DOCUMENTS**

It is agreed by the parties hereto that the following list of instruments, drawings and documents which are attached hereto, bound herewith or incorporated herein by reference constitute and shall be referred to as the "Contract Documents" and all of said instruments, drawings and documents taken together as a whole constitute the Design-Build Contract between the parties

hereto, and they are as fully a part of this Design-Build Contract as if they were set out verbatim and in full herein. The Contract Documents represent the entire and complete integration of all understandings between the City and the Contractor and supersedes all prior negotiations, representations or agreements. No prior or contemporaneous addition, deletion or other amendment hereto shall have any force or effect whatsoever, unless embodied herein in writing. No subsequent novation, renewal, addition, deletion or other amendment hereto shall have any force or effect unless embodied in a written amendatory or other agreement or change order properly executed by the parties. When the Contract Drawings and Technical Specifications are complete, they will be incorporated by written directive of the Manager or the Manager's designee.

**3.1** All of said instruments, drawings and documents taken together as a whole constitute the Design-Build Contract between the parties hereto, and they are as fully a part of this Design-Build Contract as if they were set out verbatim and in full herein.

Design-Build Contract and all Exhibits thereto

Appendix No. 1 – Standard Federal Assurance; Nondiscrimination in Airport Employment Opportunities; Certification for Contracts, Grants, Loans and Cooperative Agreements

Request for Proposals (RFP), dated September 25, 2012, including City forms and Equal Employment (incorporated by reference)

Contractor Response to RFP, dated October 31, 2012 (incorporated by reference)

Exhibit A Design-Build Criteria and Scope of Work

Exhibit A-1 Project Schedule and Milestones

Exhibit B Prevailing Wage Rate Schedule

Exhibit C Negotiated Fixed Contract Price

Exhibit D Notice to Proceed

Exhibit E General Contract Conditions (table of contents attached)

Exhibit F Special Contract Conditions

Exhibit G Performance Bond

Exhibit H Payment Bond

Exhibit I General Requirements (Division 1) (incorporated herein by reference upon City acceptance)

Exhibit J Drawings and Specifications (to be determined)

Exhibit K Minority and Women Business Enterprise Participation MBE/WBE Compliance Plan

Exhibit L Certificate of Insurance

Exhibit O Owner Controlled Insurance Program (OCIP)

**3.2** If anything in the Contract Documents is inconsistent with this Design-Build Contract, this Design-Build Contract will govern. The order of precedence of the Contract Documents shall be as follows:

**3.2.1** this Design-Build Contract, as may be modified by amendment or change orders, with precedence of amendments or change orders in reverse order of issuance;

**3.2.2** the Special Contract Conditions;

**3.2.3** the General Contract Conditions;

- 3.2.4 the Negotiated Fixed Contract Price (*Exhibit C*);
- 3.2.5 the Technical Specifications;
- 3.2.6 the Contract Drawings (100% Construction Documents);
- 3.2.7 Design Build Criteria and Scope of Work (*Exhibit A*);
- 3.2.8 Project Schedule (*Exhibit A-1*);
- 3.2.9 Contractor Response to RFP, dated October 31, 2012, to the extent that any discrepancies from the RFP have been identified by Contractor;
- 3.2.10 RFP dated September 25, 2012; and
- 3.2.11 all other Exhibits, whether attached to this Design-Build Contract, incorporated by reference or later added by Change Order.

**3.3** The intent of the Contract Documents is to include all terms, conditions, work items and services necessary or required for the proper execution and completion of the Work. The Contract Documents are complementary, and what is required by any one shall be binding as if required by all. Work items or services not covered in the Contract Documents will be required unless they are not consistent with the Contract Documents and are not inferable from the Contract Documents as being necessary to produce the result intended by the Contract Documents. Anything mentioned in the Technical Specifications and not shown on the Contract Drawings, or shown on the Contract Drawings and not mentioned in the Technical Specifications, shall be of like effect as if shown or mentioned in both. Words and abbreviations that have well known technical or trade meanings are used in the Contract Documents in accordance with such recognized meaning.

**3.4** It is contemplated by the parties that numerous exhibits or attachments, including construction documents and final technical specifications, will not be accomplished or must be developed after execution of this Design-Build Contract and, as such, must be finalized, incorporated by reference and/or attached to and be made a part of the Contract Documents subsequent to execution of this Design-Build Contract. The incorporation of such exhibits or attachments into this Design-Build Contract shall be accomplished by written directive from the Manager or the Manager's designee. The parties shall be diligent in accomplishing these exhibits and attachments. To the extent these new exhibits or attachments conflict with other exhibits or portions of this Design-Build Contract, the document with the higher precedence as identified in 3.2 shall prevail. However, nothing contained in this section shall relieve the Contractor from its obligation to identify any discrepancies in the documents, nor shall this section limit the Contractor's ability to seek Change Order time and compensation adjustments for City changes to the Work incorporated into any of these later exhibits and attachments.

**3.5** Where reference is made in this Design-Build Contract to a provision of the General Conditions or another Contract Document, the reference refers to that provision as amended or supplemented by other provisions of the Contract Documents.

## **4 SCOPE OF WORK**

**4.1 Completion Obligation.** The Contractor shall execute the Project described in the Contract Documents, except to the extent specifically indicated in the Contract Documents as the responsibility of others. The Contractor agrees to commence and undertake the performance of

the Work under this Design-Build Contract within ten (10) days of the date of issuance of a Notice to Proceed in substantially the form attached in the Special Conditions and agrees to substantially complete said Work within the Contract Time and fully complete said Work in accordance with the Contract Documents. The Contractor may complete the Project earlier than the date for substantial completion established by the Contract Time, but any claim by the Contractor based on delay shall be based upon the date for substantial completion established by the Contract Time and not on an earlier projected completion date that the Contractor may propose.

**4.2 Scope of Work.** The entire Scope of Work shall include the following phases:

**4.2.1 Program Development and Design Phase Services.** The Program Development and Design Phase Services are comprised of all those services, obligations and responsibilities necessary or required to complete for the City's review and acceptance a Project Design that strictly complies with the requirements set forth in the Design-Build Criteria and Scope of Work, incorporated herein by this reference as *Exhibit A*.

**4.2.2 Construction Phase Services.** The Construction Phase Services shall include the furnishing of all construction administration, management, supervision and coordination experience and expertise, as well as all construction services, work effort, labor, tools, supplies, manufactured components, equipment, materials, and everything else necessary and required to complete the construction of the Project on time and within budget; while satisfying the City's longstanding commitment to quality, efficiency, value, innovation, partnering, responsiveness to agency and community needs and compliance with all applicable regulatory requirements in the performance of general public improvements.

**4.2.3 The Work.** The terms "Scope of Work" or "Work" as used herein shall mean all Design and Construction Phase Services required by or reasonably inferable from the Contract Documents, whether completed or partially completed, and includes all other materials, equipment and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work shall constitute the whole of the Project.

**4.3 Acknowledgement of Scope of Work.** The Contractor expressly recognizes and acknowledges that this Project must be completed within the time and fiscal constraints as set forth throughout this Design-Build Contract.

**4.3.1** The Contractor further represents to the City that by executing this Design-Build Contract, it has been fully informed of and has thoroughly reviewed the following: the objectives of the Project; the work effort of the City's Consultants performed to date for the Project; all of the Contract Documents attached to this Design-Build Contract or incorporated by reference; and all of the Work required by the Contractor by the Contract Documents. Based upon this thorough review and analysis, the Contractor represents to the City that it will provide or perform all of the necessary Work within the requirements of the Contract Documents.

**4.3.2** Also by execution of this Design-Build Contract, the Contractor covenants and represents that the Contractor is familiar with the site of the Project (the "Site") and has had sufficient time and opportunity to independently examine and is sufficiently familiar with: the Site, the character

and nature of the Site layout and materials, the character and nature of all Site constraints, restrictions and limitations, and limitations on ingress, egress and construction staging and performance; and the local conditions under which the Work is to be performed, including weather conditions and any other factors which may impact the Work. The Contractor further represents that it has taken into consideration and correlated these direct observations, examinations and investigations with the requirements of the Contract Documents and in the pricing of the Work, the formulation of the Negotiated Fixed Contract Price, the Contractor's Fee and in preparing all Exhibits.

**4.3.3** Also by execution of this Design-Build Contract, the Contractor represents that it has reviewed and is familiar with the City's general expectations and scheduling assumptions regarding completion of the Project and occupancy of the completed facility and the requirements, constraints, and limitations occasioned by the City's occupancy schedules; and that, given the Design-Build Criteria and Scope, these scheduling assumptions are reasonable and achievable. The Contractor further represents that it has taken into consideration and correlated these assumptions and constraints with the requirements of the Contract Documents and in the pricing of the Work, the Fixed Contract Price and the Contractor's Fee.

**4.3.4** Finally, the Contractor represents that it has reviewed the Design-Build Criteria and Scope, accepts the terms and requirements thereof and affirmatively states that the Project, as expressed by these scoping documents and the Project requirements and constraints is a reasonable and constructable Project, incorporating a reasonable and workable delivery approach, schedule and budget.

## **5. RELATIONSHIP OF THE PARTIES**

**5.1** The parties intend herein to establish a relationship wherein the City relies upon the integrity and fidelity of the Contractor to complete the Project within the time and budget constraints set forth in this Design-Build Contract and in a manner which satisfies the City's longstanding commitment to quality, efficiency, value, innovation, partnering, responsiveness to agency and community needs and compliance with all applicable regulatory requirements in the performance of general public improvements.

**5.2** The Contractor accepts the relationship of trust and confidence established by this Design-Build Contract with the City. The Contractor further agrees to utilize the Contractor's reasonable skills, efforts, and judgment in furthering the interests of the City regarding the Project; to furnish at all times an adequate supply of qualified and competent workers and quality materials; and to perform the work in the best, most expeditious, and economical manner. Further, the Contractor agrees to furnish efficient business administration, construction management and superintendence and to use its reasonable efforts to complete the Work in an expeditious and economical manner, consistent with the interests of the City.

**5.3** The Contractor shall accept the designated and authorized representatives of the City identified in the Contract Documents and perform its obligations toward and in response to such representatives in the same manner it would toward and in response to the City, pursuant to such designation and authorization.



## **6. COORDINATION AND COOPERATION**

**6.1** The Contractor agrees to cooperate and coordinate fully with the City in its performance of the Work to meet or exceed the City's time and budgetary objectives and limitations, while maintaining the City's longstanding commitment to quality, efficiency, value, innovation, partnering, responsiveness to agency and community needs and compliance with all applicable regulatory requirements in the construction of general public improvements.

**6.2** The Contractor shall, as a continuing work item under this Design-Build Contract, facilitate coordination, communication and cooperation regarding its performance hereunder between the City's Department of Aviation ("Aviation"), the Project Manager, other City consultants and any affiliated entities. In addition, the Contractor shall coordinate its efforts under this Design-Build Contract with all involved governmental and regulatory entities.

**6.3** The Contractor shall be responsible for taking accurate and comprehensive minutes at all Design and Construction Phase meetings attended by the Contractor regarding the Project. Those minutes shall be prepared in a format approved by the Project Manager and issued to all attendees, as well as those other parties designated by the City, no later than three working days after the meeting. Unless approved in advance in writing by the Project Manager and to the greatest extent practicable, Project meetings with the City shall be conducted at Denver International Airport.

## **7. CONTRACT TERM AND TIME OF COMMENCEMENT**

**7.1 General.** The Contract Term shall begin on the date of this Design-Build Contract but no work shall be performed prior to the delivery of all bonds and insurance certificates (as required) of the Contractor and until the City issues a Notice to Proceed. The Contract Time for the Project shall be the period of performance beginning on the date of Notice to Proceed and the Project shall be substantially completed by the dates set forth in **Exhibit A-1** (Project Schedule and Milestones) and shall be no more than 289 calendar days. The Contractor is not authorized to commence Work prior to its receipt of the Notice to Proceed, and any Work performed prior to the Notice to Proceed is at the Contractor's sole risk, cost and expense and with no obligation by the City to pay for any such Work. Upon issuance of the Notice to Proceed all Costs of the Work incurred prior to the issuance date will be reimbursable to the Contractor subject to the approved Fixed Contract Price. Termination shall be pursuant to G.C. Title 22 except as otherwise provided herein.

### **7.2 Contract Time and Substantial Completion.**

**7.2.1** The term "Project Contract Time" is defined as the period beginning on the date of Notice to Proceed and ending on the date of Final Completion of the Work set forth in the Project Scope of Work, subject to Change Orders as provided for in the Contract Documents. The term "Final Completion" is defined in the General Conditions.

### **7.3 Liquidated Damages:** It is understood and agreed by and between the City and the

Contractor that, if the Contractor fails to achieve Substantial Completion of the Project Work within the Contract Time set forth in Article 7 and **Exhibit A**, the City will suffer substantial damages, which damages would be difficult to accurately determine. The parties hereto have considered the possible elements of damages and have agreed that the amount of liquidated damages for the Contractor's failure to substantially complete the Project work within the Contract Time. Should the Contractor fail to complete all Work within the Contract Time allocated under Article 7 and **Exhibit A**, the Contractor shall become liable to the City and County of Denver for liquidated damages, and not as a penalty, at the rate of **\$1,000.00** for each Day that the Contractor exceeds the time limits herein specified, all in accordance with provisions of General Contract Condition 602, LIQUIDATED DAMAGES; ADMINISTRATIVE COSTS; ACTUAL DAMAGES.

Representative hourly rates for the City administrative costs described in General Contract Condition 602.2 shall be as follows for this Project:

**Engineer or Architect Supervisor = \$138.00/hour**

**Project Manager = \$103.50/hour**

**Project Inspector = \$80.50/hour**

**Administrative Assistant = \$55.20/hour**

If the Contractor shall fail to pay such liquidated damages promptly upon demand therefore, the Surety on its Performance Bond and Payment Bond shall pay such damages. Also, the City may withhold all, or any part of, such liquidated damages from any payment due the Contractor. Additional provisions relating to liquidated damages are set forth in the Design Build Contract General Contract Conditions. The Parties agree that the Liquidated Damages are the sole remedy for the City on the condition that the Contractor does not seek to void the Liquidated Damages provisions in these Contract Documents or on any other basis, and in such event the City reserves all of its rights to seek actual damages from the Contractor for injury or loss suffered by the City from the acts or omissions of the Contractor, including but not limited to any other breach or default of this Design-Build Contract.

The parties agree that the foregoing amounts shall be the full amount of liquidated damages recoverable against the Contractor by the City for the Contractor's breach of its covenants of timely performance hereunder. The amount so determined shall be the full, agreed upon and liquidated damages recoverable against the Contractor by the City for the Contractor's breach of its covenants of timely performance hereunder. The provisions of this Section shall not limit the rights and remedies of the City pursuant to the General Conditions.

## **8. SUBCONTRACTOR RESPONSIBILITY**

The Contractor shall be responsible to the City for the acts and omissions of its agents and employees, Subcontractors and Suppliers of any tier, and their agents and employees performing Work under this Design-Build Contract.

## **9. COMPENSATION**

In accordance with the terms of this Design-Build Contract, the City agrees to pay the Design-Build Contractor for the performance and completion of all the work set forth in Exhibit A -

Design-Build Criteria and Scope of Work. The amount to be paid by the City to the Contractor under this Design-Build Contract shall be the Negotiated Fixed Contract Price as set forth in **Exhibit C** and shall not exceed **Nine Million Four Hundred Forty Thousand Three Hundred Sixty Four Dollars (\$9,440,364.00)**. The Contractor guarantees and warrants that the Project will be completed by its performance hereunder for the Negotiated Fixed Contract Price amount. In no event will the City's liability exceed the Negotiated Fixed Contract Price, as adjusted by duly authorized change order in accordance with this Design-Build Contract. The parties specifically agree that any performance by the Contractor hereunder shall not subject the City to any cost, charge or fee not specified above.

## **10. ADDITIONAL PROVISIONS**

### **10.1 Compliance with Minority/Women Business Enterprise Requirements.**

This Contract is subject to all applicable provisions of Divisions 1 and 3 of Article III, of Chapter 28, Denver Revised Municipal Code (D.R.M.C.), designated as Sections 28-31 – 29-36 and 28-52 – 28-90 D.R.M.C. and referred to in this Contract as the "M/WBE Ordinance". In accordance with the requirements of the M/WBE Ordinance, the Contractor is committed to, at a minimum, meet the participation goal of **two percent (2.0%)** established for this Project utilizing properly certified M/WBE subcontractors and suppliers. In addition to the applicable provisions of the M/WBE Ordinance, the Contractor agrees, as an express condition of its performance hereunder, to comply with the requirements of any approved Small Business Enterprise Compliance Plan (attached and incorporated herein as **Exhibit K**). Such plan shall, at a minimum, include a narrative regarding compliance with the goal; a list of committed M/WBE participants along with dollar and percent participation for each evidencing compliance with the overall goal, and fully executed letters of intent for each listed participant, all in a form satisfactory to the City. Without limiting the general applicability of the foregoing, the Contractor acknowledges its continuing duty, pursuant to Sections 28-72, 28-73 and 28-75 D.R.M.C. and the M/WBE Program, to meet and maintain throughout the duration of this Construction Contract its participation and compliance commitments and to ensure that all Subcontractors subject to the M/WBE Ordinance or the M/WBE Program also maintain such commitments and compliance. Failure to comply with these requirements may result, at the discretion of the Director of the Division of Small Business Opportunity ("DSBO"), in the imposition of sanctions against the Contractor in accordance with Section 28-77, D.R.M.C. Nothing contained in this Paragraph or in the referenced City ordinance shall negate the City's right to prior approval of Subcontractors, or substitutes therefore, under this Construction Contract.

**10.2 Compliance with Wage Rate Requirements.** In performance of all Work hereunder, the Contractor agrees to comply with and be bound by all requirements and conditions of the City's Payment of Prevailing Wages Ordinance, Sections 20-76 through 20-79, DRMC, including but not limited to all Design-Build Contract anniversary date wage rate adjustments, and any determinations made by the City pursuant thereto. In accordance with Section 20-76(b), DRMC, the prevailing wage rate schedule applicable to this Design-Build Contract shall be the most current schedule available at the time the Contractor executes this Design-Build Contract and such schedule is attached hereto and incorporated herein as **Exhibit B**. For purposes of establishing a date for prevailing wage rate anniversary adjustments the contract date should be

the date of the attached wage rate schedule (*Exhibit B*).

**10.3 Applicability of Laws.** This Design-Build Contract between the Contractor and the City shall be deemed to have been made in the City and County of Denver, State of Colorado and shall be subject to, governed by and interpreted and construed in accordance with the laws of the State of Colorado and the Charter, the Revised Municipal Code, Rules, Regulations, Executive Orders and fiscal rules of the City. As such, the Contractor shall at all times comply with the provisions of the Charter, Revised Municipal Code, Rules, Regulations, Executive Orders and fiscal rules of the City, and those of the State of Colorado and Federal Laws and Rules and Regulations, which in any manner limit, control or apply to the actions or operations of the Contractor, any Subcontractors, employees, agents or servants of the Contractor engaged in the Work or affecting the materials and equipment used in the performance of the Work, as the same may be, from time to time, promulgated, revised or amended. The Charter and Revised Municipal Code of the City, as the same may be amended from time to time, are hereby expressly incorporated into this Design-Build Contract as if fully set out herein by this reference.

**10.4 Appropriation.** Notwithstanding any other term, provision, or condition herein, all payment obligations under this Design-Build Contract shall be limited to the funds duly and lawfully appropriated and encumbered, or otherwise made available by the Denver City Council and paid into the Treasury of the City. As of the date of this Design-Build Contract, **TEN MILLION AND no/100 Dollars (\$10,000,000.00)** have been appropriated and encumbered for this Design-Build Contract. The Manager, upon reasonable written request, will advise the Contractor in writing of the total amount of appropriated and encumbered funds that are or remain available for payment to the Contractor. The issuance of any form of order or directive by the City which would cause the aggregate amount payable to the Contractor to exceed the amount appropriated for the Work to be performed in accordance with the Contract Documents is expressly prohibited. In no event shall the issuance of any change order or other form of order or directive by the City be considered valid or binding if it requires additional compensable Work to be performed, which Work will cause the aggregate amount payable for such Work to exceed the amount appropriated and encumbered for the Work, unless and until such time as the Contractor has been advised in writing by the Manager that a lawful appropriation sufficient to cover the entire cost of such additional Work has been made. It shall be the responsibility of the Contractor to verify that the amounts already appropriated for the Work are sufficient to cover the entire cost of such Work, and any Work undertaken or performed in excess of the amount appropriated is undertaken or performed in violation of the terms of this Design-Build Contract, without the proper authorization for such Work, and at the Contractor's own risk and sole expense.

**10.5 Approvals.** In the event this Design-Build Contract calls for the payment by the City of five hundred thousand dollars (\$500,000.00) or more, approval by the City Council of the City and County of Denver, acting by ordinance, in accordance with Section 3.2.6 of the Charter of the City and County of Denver, is and shall be an express condition precedent to the lawful and binding execution and effect and performance of this Design-Build Contract.

**10.6 Assignment Strictly Prohibited.** The Contractor shall not assign or otherwise transfer, in whole or in part, any of its rights, benefits, claims, obligations, duties or entitlement to monies

owed or which may become due under this Design-Build Contract, except upon the prior written consent and approval of the Manager to such assignment.

**10.7 Conflict of Interest.** The parties agree that no official, officer or employee of the City shall have any personal or beneficial interest whatsoever in the services or property described herein and the City further agrees not to hire or contract for services with any official, officer or employee of the City or any other person which would be in violation of the Denver Revised Municipal Code Chapter 2, Article IV, Code of Ethics, or Denver City Charter provisions 1.2.9 and 1.2.12.

**10.8 Taxes, Charges and Penalties.** Except as provided in the City's Prompt Payment ordinance, codified at DRMC Sections 20-107, 20-108 and 20-109, the City shall not be liable for the payment of any taxes, late charges, interest or penalties of any nature arising out of this Design-Build Contract.

**10.9 Waiver of C.R.S. 13-20-802 et. seq.** The Contractor specifically waives all the provisions of Part 8 of Article 20 of Title 13, Colorado Revised Statutes regarding defects in the Work under this Design-Build Contract.

**10.10 Proprietary or Confidential Information.**

**10.10.1 City Information:** The Contractor understands and agrees that, in performance of this Design-Build Contract, the Contractor may have access to private or confidential information that may be owned or controlled by the City and that such information may contain proprietary or confidential details, the disclosure of which to third parties may be damaging to the City. The Contractor agrees that all information disclosed by the City to the Contractor shall be held in confidence and used only in performance of the Design-Build Contract. The Contractor shall exercise the same standard of care to protect such information as a reasonably prudent Contractor would to protect its own proprietary data.

**10.10.2 Contractor Information:** The parties understand that all the material provided or produced under this Design-Build Contract may be subject to the Colorado Open Records Act, C.R.S. 24-72-201, et seq., and that in the event of a request to the City for disclosure of such information, the City shall advise the Contractor of such request in order to give the Contractor the opportunity to object to the disclosure of any of its proprietary or confidential material. In the event of the filing of a lawsuit to compel such disclosure, the City will tender all such material to the court for judicial determination of the issue of disclosure and the Contractor agrees to intervene in such lawsuit to protect and assert its claims of privilege against disclosure of such material. The Contractor further agrees to defend, indemnify and save and hold harmless the City, its officers, agents and employees, from any claim, damages, expense, loss or costs arising out of the Contractor's intervention to protect and assert its claims of privilege against disclosure under this Section including, but not limited to, prompt reimbursement to the City of all reasonable attorney fees, costs and damages that the City may incur directly or may be ordered to pay by such court.

**10.11 Status of Contractor.** It is understood and agreed that the status of the Contractor shall

be that of an independent contractor retained on a contractual basis to perform work or services for limited periods of time, and it is not intended, nor shall it be construed, that the Contractor, or any member of its staff or any consultant, is an employee or officer of the City for any purpose whatsoever.

**10.12 Rights and Remedies Not Waived.** No payment or failure to act under the Design-Build Contract by the City shall constitute a waiver of any breach of covenant or default which may then exist on the part of the Contractor. No assent, expressed or implied, by either party to any breach of the Design-Build Contract shall be held to be a waiver of any default or other breach.

**10.13 Notices.** Any notices, demands, or other communications required or permitted to be given by any provision of this Design-Build Contract shall be given in writing, delivered personally or sent by registered mail, postage prepaid and return receipt requested, addressed to the parties at the addresses set forth herein or at such other address as either party may hereafter or from time to time designate by written notice to the other party given in accordance herewith. Notice shall be considered received on the day on which such notice is actually received by the party to whom it is addressed, or the third (3rd) day after such notice is mailed, whichever is earlier. Unless changed in writing, such notices shall be mailed to:

If to the Contractor: PCL Construction Services, Inc.  
Trey Nobles, Vice President  
2000 South Colorado Blvd., Ste. 2-500  
Denver, CO 80222

If to the City: Manager of Aviation  
Airport Office Building  
8500 Peña Blvd.  
Denver, CO 80249-6340

With a copy to: Airport Legal Services  
Airport Office Building  
8500 Peña Blvd. #9810  
Denver, CO 80249-6340

**10.14 Survival of Certain Provisions.** The parties understand and agree that all terms, conditions and covenants of this Design-Build Contract, together with the exhibits and attachments hereto, if any, any or all of which, by reasonable implication, contemplate continued performance or compliance beyond the expiration or termination of this Design-Build Contract (by expiration of the term or otherwise), shall survive such expiration or termination and shall continue to be enforceable as provided herein. Without limiting the generality of the foregoing, the Contractor's obligations for the provision of insurance, for indemnity to the City and for preserving confidentiality of trade secrets and other information shall survive for a period equal to any and all relevant statutes of limitation, plus the time necessary to fully resolve any claims, matters, or actions begun within that period.

**10.15 Contract Binding.** It is agreed that this Design-Build Contract shall be binding on and inure to the benefit of the parties hereto, their heirs, executors, administrators, successors and duly authorized assigns.

**10.16 Paragraph Headings.** The captions and headings set forth herein are for convenience of reference only and shall not be construed so as to define or limit the terms and provisions hereof.

**10.17 Severability.** It is understood and agreed by the parties hereto that, if any part, term, or provision of this Design-Build Contract, except for the provisions of this Design-Build Contract requiring prior appropriation and limiting the total amount to be paid by the City, is by the courts held to be illegal or in conflict with any law of the State of Colorado, the validity of the remaining portions or provisions shall not be affected, and the rights and obligations of the parties shall be construed and enforced as if the Design-Build Contract did not contain the particular part, term or provision held to be invalid.

**10.18 Counterparts.** This Design-Build Contract will be executed in two (2) counterparts, each of which shall be deemed to be an original, and all of which taken together, shall constitute one and the same instrument.

**10.19 Electronic Signatures and Electronic Records.** Contractor consents to the use of electronic signatures by the City. The Contract, and any other documents requiring a signature hereunder, may be signed electronically by the City in the manner specified by the City. The Parties agree not to deny the legal effect or enforceability of the Contract solely because it is in electronic form or because an electronic record was used in its formation. The Parties agree not to object to the admissibility of the Contract in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

[END OF PAGE]

## STANDARD FEDERAL ASSURANCES ATTACHMENT 1

NOTE: As used below the term "contractor" shall mean and include the "Party of the Second Part," and the term "sponsor" shall mean the "City".

During the term of this contract, the contractor, for itself, its assignees and successors in interest (hereinafter referred to as the "contractor") agrees as follows:

1. Compliance with Regulations. The contractor shall comply with the Regulations relative to nondiscrimination in federally assisted programs of the Department of Transportation (hereinafter "DOT") Title 49, Code of Federal Regulations, Part 21, as they may be amended from time to time (hereinafter referred to as the Regulations), which are herein incorporated by reference and made a part of this contract.

2. Nondiscrimination. The contractor, with regard to the work performed by it during the contract, shall not discriminate on the grounds of race, color, sex, creed or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The contractor shall not participate either directly or indirectly in the discrimination prohibited by section 21.5 of the Regulations, including employment practices when the contract covers a program set forth in Appendix B of the Regulations.

3. Solicitations for Subcontractors, Including Procurements of Materials and Equipment. In all solicitations either by competitive bidding or negotiations made by the contractor for work to be performed under a subcontract, including procurements or materials or leases of equipment, each potential subcontractor or supplier shall be notified by the contractor of the contractor's obligations under this contract and the Regulations relative to nondiscrimination on the grounds of race, color, or national origin.

4. Information and Reports. The contractor shall provide all information and reports required by the Regulations or directives issued pursuant thereto and shall permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the sponsor or the Federal Aviation Administration (FAA) to be pertinent to ascertain compliance with such Regulations, orders, and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish this information, the contractor shall so certify to the sponsor of the FAA, as appropriate, and shall set forth what efforts it has made to obtain the information.

5. Sanctions for Noncompliance. In the event of the contractor's noncompliance with the nondiscrimination provisions of this contract, the sponsor shall impose such contract sanctions as it or the FAA may determine to be appropriate, including, but not limited to:

- a. Withholding of payments to the contractor under the contract until the contractor complies, and/or
- b. Cancellation, termination, or suspension of the contract, in whole or in part.

6. Incorporation of Provisions. The contractor shall include the provisions of paragraphs 1 through 5 in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Regulations or directives issued pursuant thereto. The



contractor shall take such action with respect to any subcontract or procurement as the sponsor or the FAA may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, however, that in the event a contractor becomes involved in, or is threatened with, litigation with a subcontractor or supplier as a result of such direction, the contractor may request the sponsor to enter into such litigation to protect the interests of the sponsor and, in addition, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

## **NONDISCRIMINATION IN AIRPORT EMPLOYMENT OPPORTUNITIES**

The Party of the Second Part assures that it will comply with pertinent statutes, Executive Orders and such rules as are promulgated to assure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or handicap be excluded from participating in any activity conducted with or benefiting from Federal assistance. This Provision obligates the Party of the Second Part or its transferee for the period during which Federal assistance is extended to the airport program, except where Federal assistance is to provide, or is in the form of personal property or real property or an interest therein or structures or improvements thereon. In these cases, this Provision obligates the Party of the Second Part or any transferee for the longer of the following periods: (a) the period during which the property is used by the sponsor or any transferee for a purpose for which Federal assistance is extended, or for another purpose involving the provision of similar services or benefits; or (b) the period during which the airport sponsor or any transferee retains ownership or possession of the property. In the case of contractors, this Provision binds the contractors from the bid solicitation period through the completion of the contract.

**It is unlawful for airport operators and their lessees, tenants, concessionaires and contractors to discriminate against any person because of race, color, national origin, sex, creed, or handicap in public services and employment opportunities.**

### **Certification for Contracts, Grants, Loans and Cooperative Agreements**

The Contractor certifies by execution of this Agreement to the best of its knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Contractor to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any federal contract, grant loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the Contractor shall complete and submit Standard Form-LLL, "Disclosure of Lobby Activities," in accordance with its instructions.

(3) The Contractor shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this transaction is a prerequisite for making or entering into this transaction imposed by Section 1352, Title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$ 100,000 for each such failure.

**Contract Control Number:**

IN WITNESS WHEREOF, the parties have set their hands and affixed their seals at  
Denver, Colorado as of

SEAL

**CITY AND COUNTY OF DENVER**

ATTEST:

By\_\_\_\_\_

\_\_\_\_\_

APPROVED AS TO FORM:

REGISTERED AND COUNTERSIGNED:

By\_\_\_\_\_

By\_\_\_\_\_

By\_\_\_\_\_



IN WITNESS WHEREOF, the parties have caused this Agreement to be executed at Denver, Colorado as of the date indicated on the City signature page.

Contract Control Number:

201310374

Vendor Name:

PCL CONSTRUCTION SERVICES, INC.

By:



Name:

TREY NOBLES  
(please print)

Title:

VICE PRESIDENT / DISTRICT MANAGER  
(please print)

ATTEST: (if required)

  
SENAM HANNAWAY  
SECRETARY/TREASURER

By:

\_\_\_\_\_

Name:

\_\_\_\_\_  
(please print)

Title:

\_\_\_\_\_  
(please print)



## PERFORMANCE BOND

**KNOW ALL MEN BY THESE PRESENTS**, that we, the undersigned PCL CONSTRUCTION a corporation organized under the laws of the State of COLORADO, hereinafter referred to as the "Contractor" and Fidelity and Deposit Company of Maryland, Travelers Casualty and Surety Company of America, Federal Insurance Company, a corporation organized under the laws of the State of MD, CT, IN, and authorized to transact business in the State of Colorado, hereinafter referred to as Surety, are held and firmly bound unto the CITY AND COUNTY OF DENVER, a municipal corporation of the State of Colorado, hereinafter referred to as the "CITY", in the penal sum of TEN MILLION DOLLARS and NO Cents (\$10,000,000.00) lawful money of the United States of America, for the payment of which sum the Contractor and Surety bind themselves and their heirs, executors, administrators, successors and assigns, jointly and severally by these presents.

**WHEREAS**, the above Contractor has entered into a written contract with the City for furnishing all labor, materials, equipment, tools, superintendence, and other facilities and accessories for the construction of Contract No. 201207370, DIA Data Center, Denver International Airport, in accordance with the Technical Specifications, Contract Drawings and all other Contract Documents therefor which are incorporated herein by reference and made a part hereof, and are herein referred to as the Contract.

**NOW, THEREFORE**, the condition of this performance bond is such that if the Contractor:

1. Promptly and faithfully observes, abides by and performs each and every covenant, condition and part of said Contract, including, but not limited to, its warranty provisions, in the time and manner prescribed in the Contract, and
2. Pays the City all losses, damages (liquidated or actual, including, but not limited to, damages caused by delays in the performance of the Contract), expenses, costs and attorneys' fees, that the City sustains resulting from any breach or default by the Contractor under the Contract, then this bond is void; otherwise, it shall remain in full force and effect.

**IN ADDITION**, if said Contractor fails to duly pay for any labor, materials, team hire, sustenance, provisions, provender, or any other supplies used or consumed by said Contractor or its subcontractors in its performance of the work contracted to be done or fails to pay any person who supplies rental machinery, tools, or equipment, all amounts due as the result of the use of such machinery, tools, or equipment in the prosecution of the work, the Surety shall pay the same in an amount not exceeding the amount of this obligation, together with interest as provided by law.


**PROVIDED FURTHER**, that the said Surety, for value received, hereby stipulates and agrees that any and all changes in the Contract or compliance or noncompliance with the formalities in the Contract for making such changes shall not affect the Surety's obligations under this bond and the Surety hereby waives notice of any such changes.

(End of Page)


IN WITNESS WHEREOF, said Contractor and said Surety have executed these presents as of  
this 3rd day of July, 2013.

PCL Construction Services, Inc.

CONTRACTOR


By:   
Vice President and District Manager  
Trey Nobles  
Fidelity and Deposit Company of Maryland  
Travelers Casualty and Surety Company of America  
Federal Insurance Company

SURETY

By:   
Attorney-in-Fact  
Sandra M. Winsted

(Accompany this bond with Attorney-in-Fact's authority from the Surety to execute bond,  
certified to include the date of the bond.)


CITY AND COUNTY OF DENVER

By:   
MAYOR

By:   
Manager of Aviation

APPROVED AS TO FORM:

DOUGLAS J. FRIEDNASH, Attorney for the  
City and County of Denver

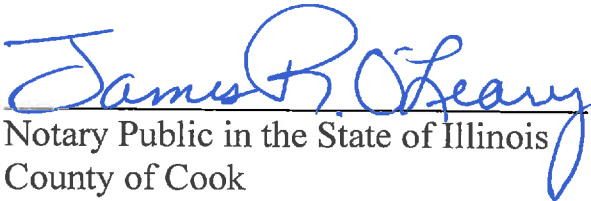
By:   
Assistant City Attorney

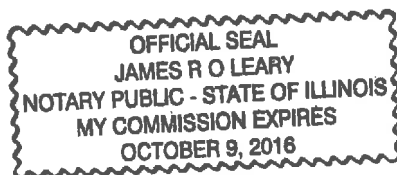
## ACKNOWLEDGEMENT BY SURETY

STATE OF ILLINOIS  
COUNTY OF COOK

On this 3<sup>rd</sup> day of July, 2013 before me, James R. O'Leary, a Notary Public, within and for said County and State, personally appeared Sandra M. Winsted to me personally known to be the Attorney-in-Fact of and for Fidelity and Deposit Company of Maryland, Travelers Casualty and Surety Company of America, Federal Insurance Company and acknowledged that she executed the said instrument as the free act and deed of said Company.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County, the day and year in this certificate first above written.

  
Notary Public in the State of Illinois  
County of Cook





**ZURICH AMERICAN INSURANCE COMPANY  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND  
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **THOMAS O. MCCLELLAN, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Sandra M. WINSTED, Karen L. DANIEL, Susan A. WELSH, Judith A. LUCKY-EFTIMOV, James B. MCTAGGART, Debra J. DOYLE, Sandra M. NOWAK and Melissa L. FORTIER, all of Chicago, Illinois, EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings**, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 4th day of December, A.D. 2012.

**ATTEST:**

**ZURICH AMERICAN INSURANCE COMPANY  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



By: *Gerald F. Haley*

*Assistant Secretary  
Gerald F. Haley*

*Thomas O. McClellan*

*Vice President  
Thomas O. McClellan*

**State of Maryland  
City of Baltimore**

On this 4th day of December, A.D. 2012, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **THOMAS O. MCCLELLAN, Vice President, and GERALD F. HALEY, Assistant Secretary**, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, deposeth and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

*Maria D. Adamski*

*Maria D. Adamski, Notary Public  
My Commission Expires: July 8, 2015*





## POWER OF ATTORNEY

Farmington Casualty Company  
Fidelity and Guaranty Insurance Company  
Fidelity and Guaranty Insurance Underwriters, Inc.  
St. Paul Fire and Marine Insurance Company  
St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company  
Travelers Casualty and Surety Company  
Travelers Casualty and Surety Company of America  
United States Fidelity and Guaranty Company

Attorney-In Fact No. 225712

Certificate No. 005461953

**KNOW ALL MEN BY THESE PRESENTS:** That Farmington Casualty Company, St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company are corporations duly organized under the laws of the State of Connecticut, that Fidelity and Guaranty Insurance Company is a corporation duly organized under the laws of the State of Iowa, and that Fidelity and Guaranty Insurance Underwriters, Inc., is a corporation duly organized under the laws of the State of Wisconsin (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint

Debra J. Doyle, Diane M. O'Leary, Geoffrey E. Heekin, James B. McTaggart, Jennifer L. Jakaitis, Judith A. Lucky-Eftimov, Karen L. Daniel, Richard A. Moore Jr., Sandra M. Winsted, Sandra M. Nowak, Susan A. Welsh, Melissa L. Fortier, and Derek Elston

of the City of Chicago, State of Illinois, their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 25th day of April, 2013.

Farmington Casualty Company  
Fidelity and Guaranty Insurance Company  
Fidelity and Guaranty Insurance Underwriters, Inc.  
St. Paul Fire and Marine Insurance Company  
St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company  
Travelers Casualty and Surety Company  
Travelers Casualty and Surety Company of America  
United States Fidelity and Guaranty Company



State of Connecticut  
City of Hartford ss.

By: 

Robert L. Raney, Senior Vice President

On this the 25th day of April, 2013, before me personally appeared Robert L. Raney, who acknowledged himself to be the Senior Vice President of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

In Witness Whereof, I hereunto set my hand and official seal.  
My Commission expires the 30th day of June, 2016.



  
Marie C. Tetreault, Notary Public



Chubb  
Surety

POWER  
OF  
ATTORNEY

Federal Insurance Company  
Vigilant Insurance Company  
Pacific Indemnity Company

Attn: Surety Department  
15 Mountain View Road  
Warren, NJ 07059

Know All by These Presents, That FEDERAL INSURANCE COMPANY, an Indiana corporation, VIGILANT INSURANCE COMPANY, a New York corporation, and PACIFIC INDEMNITY COMPANY, a Wisconsin corporation, do each hereby constitute and appoint Marcia K. Cesafsky, Karen L. Daniel, Debra J. Doyle, Robert E. Duncan, Melissa L. Fortier, Jennifer L. Jakaitis, James B. McTaggart, Linda M. Napolillo, Sandra M. Nowak, Diane M. O'Leary, Christopher P. Troha, Susan A. Welsh and Sandra M. Winsted of Chicago, Illinois

each as their true and lawful Attorney-in-Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations.

In Witness Whereof, said FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY have each executed and attested these presents and affixed their corporate seals on this 1st day of October, 2012.

*Kenneth C. Wendel*  
Kenneth C. Wendel, Assistant Secretary

*David B. Norris, Jr.*  
David B. Norris, Jr., Vice President

STATE OF NEW JERSEY

County of Somerset

ss.

On this 1st day of October, 2012 before me, a Notary Public of New Jersey, personally came Kenneth C. Wendel, to me known to be Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY, the companies which executed the foregoing Power of Attorney, and the said Kenneth C. Wendel, being by me duly sworn, did depose and say that he is Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such by like authority; and that he is acquainted with David B. Norris, Jr., and knows him to be Vice President of said Companies; and that the signature of David B. Norris, Jr., subscribed to said Power of Attorney is in the genuine handwriting of David B. Norris, Jr., and was thereto subscribed by authority of said By-Laws and in deponent's presence.

Notarial Seal



KATHERINE J. ADELAAR  
NOTARY PUBLIC OF NEW JERSEY  
No 2316685  
Commission Expires July 16, 2014

*Katherine J. Adelaar*  
Notary Public

### CERTIFICATION

Extract from the By-Laws of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY:

"All powers of attorney for and on behalf of the Company may and shall be executed in the name and on behalf of the Company, either by the Chairman or the President or a Vice President or an Assistant Vice President, jointly with the Secretary or an Assistant Secretary, under their respective designations. The signature of such officers may be engraved, printed or lithographed. The signature of each of the following officers: Chairman, President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary and the seal of the Company may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such power of attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached."

I, Kenneth C. Wendel, Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY (the "Companies") do hereby certify that

- (i) the foregoing extract of the By-Laws of the Companies is true and correct,
- (ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U.S. Treasury Department; further, Federal and Vigilant are licensed in Puerto Rico and the U.S. Virgin Islands, and Federal is licensed in American Samoa, Guam, and each of the Provinces of Canada except Prince Edward Island; and
- (iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Warren, NJ this

3 day of July, 2013



*Kenneth C. Wendel*  
Kenneth C. Wendel, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT ADDRESS LISTED ABOVE, OR BY Telephone (908) 903- 3493 Fax (908) 903- 3656

e-mail: [surety@chubb.com](mailto:surety@chubb.com)

**PAYMENT BOND**

**KNOW ALL MEN BY THESE PRESENTS**, that we, the undersigned PCL CONSTRUCTION SERVICES, INC., a corporation organized under the laws of the State of COLORADO, hereinafter referred to as the "Contractor" and <sup>Fidelity and Deposit Company of Maryland, Travelers Casualty and Surety Company</sup> of America, Federal Insurance Company, a corporation organized under the laws of the State of MD, CT, IN, and authorized to transact business in the State of Colorado, hereinafter referred to as Surety, are held and firmly bound unto the CITY AND COUNTY OF DENVER, a municipal corporation of the State of Colorado, hereinafter referred to as the "CITY", in the penal sum of TEN MILLION Dollars AND No Cents (\$10,000,000.00), lawful money of the United States of America, for the payment of which sum the Contractor and Surety bind themselves and their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

**WHEREAS**, the above Contractor has entered into a written contract with the City for furnishing all labor, materials, tools, superintendence, and other facilities and accessories for the construction of Contract No. 201207370, DIA Data Center, Denver International Airport, in accordance with the Technical Specifications, Contract Drawings and all other Contract Documents therefor which are incorporated herein by reference and made a part hereof, and are herein referred to as the Contract.

**NOW, THEREFORE**, the condition of this payment bond obligation is such that if the Contractor shall at all times promptly make payments of all amounts lawfully due to all persons supplying or furnishing it or its subcontractors with labor and materials, rental machinery, tools, or equipment, used or performed in the prosecution of work provided for in the above Contract and shall indemnify and save harmless the City to the extent of any and all payments in connection with the carrying out of such Contract which the City may be required to make under the law, then this obligation shall be null and void, otherwise, it shall remain in full force and effect;

**PROVIDED FURTHER**, that the said Surety, for value received, hereby stipulates and agrees that any and all changes in the Contract, or compliance or noncompliance with the formalities in the Contract for making such changes shall not affect the Surety's obligations under this bond and the Surety hereby waives notice of any such changes.

[END OF PAGE]

IN WITNESS WHEREOF, said Contractor and said Surety have executed these presents as of this 3rd day of July, 2013.

PCL Construction Services, Inc.

CONTRACTOR

By: 

Vice President and District Manager

Trey Nobles

Fidelity and Deposit Company of Maryland

Travelers Casualty and Surety Company of America

Federal Insurance Company

SURETY

By: 

Attorney-in-Fact

Sandra M. Winsted

(Accompany this bond with Attorney-in-Fact's authority from the Surety to execute bond, certified to include the date of the bond.)

CITY AND COUNTY OF DENVER

By: 

MAYOR

By: 

Manager of Aviation

APPROVED AS TO FORM:

DOUGLAS J. FRIEDNASH, Attorney for the  
City and County of Denver

By: 

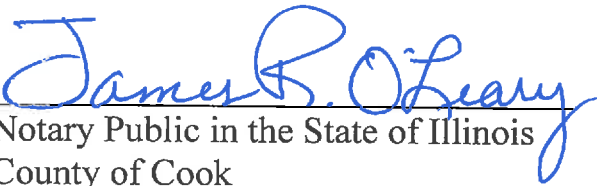
Assistant City Attorney

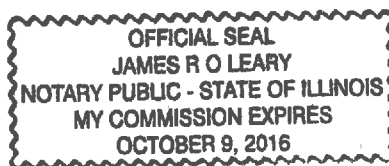
## ACKNOWLEDGEMENT BY SURETY

STATE OF ILLINOIS  
COUNTY OF COOK

On this 3<sup>rd</sup> day of July, 2013 before me, James R. O'Leary, a Notary Public, within and for said County and State, personally appeared Sandra M. Winsted to me personally known to be the Attorney-in-Fact of and for Fidelity and Deposit Company of Maryland, Travelers Casualty and Surety Company of America, Federal Insurance Company and acknowledged that she executed the said instrument as the free act and deed of said Company.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County, the day and year in this certificate first above written.

  
Notary Public in the State of Illinois  
County of Cook



**ZURICH AMERICAN INSURANCE COMPANY  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND  
POWER OF ATTORNEY**

KNOW ALL MEN BY THESE PRESENTS: That the ZURICH AMERICAN INSURANCE COMPANY, a corporation of the State of New York, the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, a corporation of the State of Maryland, and the FIDELITY AND DEPOSIT COMPANY OF MARYLAND a corporation of the State of Maryland (herein collectively called the "Companies"), by **THOMAS O. MCCLELLAN, Vice President**, in pursuance of authority granted by Article V, Section 8, of the By-Laws of said Companies, which are set forth on the reverse side hereof and are hereby certified to be in full force and effect on the date hereof, do hereby nominate, constitute, and appoint **Sandra M. WINSTED, Karen L. DANIEL, Susan A. WELSH, Judith A. LUCKY-EFTIMOV, James B. MCTAGGART, Debra J. DOYLE, Sandra M. NOWAK and Melissa L. FORTIER**, all of Chicago, Illinois, **EACH** its true and lawful agent and Attorney-in-Fact, to make, execute, seal and deliver, for, and on its behalf as surety, and as its act and deed: **any and all bonds and undertakings**, and the execution of such bonds or undertakings in pursuance of these presents, shall be as binding upon said Companies, as fully and amply, to all intents and purposes, as if they had been duly executed and acknowledged by the regularly elected officers of the ZURICH AMERICAN INSURANCE COMPANY at its office in New York, New York., the regularly elected officers of the COLONIAL AMERICAN CASUALTY AND SURETY COMPANY at its office in Owings Mills, Maryland., and the regularly elected officers of the FIDELITY AND DEPOSIT COMPANY OF MARYLAND at its office in Owings Mills, Maryland., in their own proper persons.

The said Vice President does hereby certify that the extract set forth on the reverse side hereof is a true copy of Article V, Section 8, of the By-Laws of said Companies, and is now in force.

IN WITNESS WHEREOF, the said Vice-President has hereunto subscribed his/her names and affixed the Corporate Seals of the said **ZURICH AMERICAN INSURANCE COMPANY, COLONIAL AMERICAN CASUALTY AND SURETY COMPANY, and FIDELITY AND DEPOSIT COMPANY OF MARYLAND**, this 4th day of December, A.D. 2012.

**ATTEST:**

**ZURICH AMERICAN INSURANCE COMPANY  
COLONIAL AMERICAN CASUALTY AND SURETY COMPANY  
FIDELITY AND DEPOSIT COMPANY OF MARYLAND**



By: *Gerald F. Haley*

*Assistant Secretary  
Gerald F. Haley*

*Thomas O. McClellan*

*Vice President  
Thomas O. McClellan*

**State of Maryland  
City of Baltimore**

On this 4th day of December, A.D. 2012, before the subscriber, a Notary Public of the State of Maryland, duly commissioned and qualified, **THOMAS O. MCCLELLAN, Vice President, and GERALD F. HALEY, Assistant Secretary**, of the Companies, to me personally known to be the individuals and officers described in and who executed the preceding instrument, and acknowledged the execution of same, and being by me duly sworn, depose and saith, that he/she is the said officer of the Company aforesaid, and that the seals affixed to the preceding instrument are the Corporate Seals of said Companies, and that the said Corporate Seals and the signature as such officer were duly affixed and subscribed to the said instrument by the authority and direction of the said Corporations.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed my Official Seal the day and year first above written.

*Maria D. Adamski*

*Maria D. Adamski, Notary Public  
My Commission Expires: July 8, 2015*







## POWER OF ATTORNEY

Farmington Casualty Company  
Fidelity and Guaranty Insurance Company  
Fidelity and Guaranty Insurance Underwriters, Inc.  
St. Paul Fire and Marine Insurance Company  
St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company  
Travelers Casualty and Surety Company  
Travelers Casualty and Surety Company of America  
United States Fidelity and Guaranty Company

Attorney-In Fact No. 225712

Certificate No. 005461954

**KNOW ALL MEN BY THESE PRESENTS:** That Farmington Casualty Company, St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company are corporations duly organized under the laws of the State of Connecticut, that Fidelity and Guaranty Insurance Company is a corporation duly organized under the laws of the State of Iowa, and that Fidelity and Guaranty Insurance Underwriters, Inc., is a corporation duly organized under the laws of the State of Wisconsin (herein collectively called the "Companies"), and that the Companies do hereby make, constitute and appoint

Debra J. Doyle, Diane M. O'Leary, Geoffrey E. Heekin, James B. McTaggart, Jennifer L. Jakaitis, Judith A. Lucky-Eftimov, Karen L. Daniel, Richard A. Moore Jr., Sandra M. Winsted, Sandra M. Nowak, Susan A. Welsh, Melissa L. Fortier, and Derek Elston

of the City of Chicago, State of Illinois, their true and lawful Attorney(s)-in-Fact, each in their separate capacity if more than one is named above, to sign, execute, seal and acknowledge any and all bonds, recognizances, conditional undertakings and other writings obligatory in the nature thereof on behalf of the Companies in their business of guaranteeing the fidelity of persons, guaranteeing the performance of contracts and executing or guaranteeing bonds and undertakings required or permitted in any actions or proceedings allowed by law.

IN WITNESS WHEREOF, the Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 25th day of April, 2013.

Farmington Casualty Company  
Fidelity and Guaranty Insurance Company  
Fidelity and Guaranty Insurance Underwriters, Inc.  
St. Paul Fire and Marine Insurance Company  
St. Paul Guardian Insurance Company

St. Paul Mercury Insurance Company  
Travelers Casualty and Surety Company  
Travelers Casualty and Surety Company of America  
United States Fidelity and Guaranty Company



State of Connecticut  
City of Hartford ss.

By: 

Robert L. Raney, Senior Vice President

On this the 25th day of April, 2013, before me personally appeared Robert L. Raney, who acknowledged himself to be the Senior Vice President of Farmington Casualty Company, Fidelity and Guaranty Insurance Company, Fidelity and Guaranty Insurance Underwriters, Inc., St. Paul Fire and Marine Insurance Company, St. Paul Guardian Insurance Company, St. Paul Mercury Insurance Company, Travelers Casualty and Surety Company, Travelers Casualty and Surety Company of America, and United States Fidelity and Guaranty Company, and that he, as such, being authorized so to do, executed the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

In Witness Whereof, I hereunto set my hand and official seal.  
My Commission expires the 30th day of June, 2016.



  
Marie C. Tetreault, Notary Public





Chubb  
Surety

POWER  
OF  
ATTORNEY

Federal Insurance Company  
Vigilant Insurance Company  
Pacific Indemnity Company

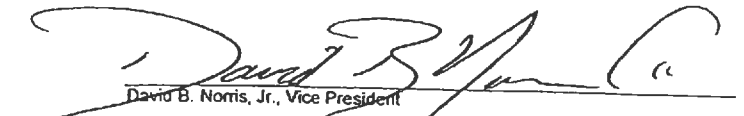
Attn: Surety Department  
15 Mountain View Road  
Warren, NJ 07059

Know All by These Presents, That FEDERAL INSURANCE COMPANY, an Indiana corporation, VIGILANT INSURANCE COMPANY, a New York corporation, and PACIFIC INDEMNITY COMPANY, a Wisconsin corporation, do each hereby constitute and appoint Marcia K. Cesafsky, Karen L. Daniel, Debra J. Doyle, Robert E. Duncan, Melissa L. Fortier, Jennifer L. Jakaitis, James B. McTaggart, Linda M. Napolillo, Sandra M. Nowak, Diane M. O'Leary, Christopher P. Troha, Susan A. Welsh and Sandra M. Winsted of Chicago, Illinois

each as their true and lawful Attorney-in-Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations

In Witness Whereof, said FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY have each executed and attested these presents and affixed their corporate seals on this 1st day of October, 2012.

  
Kenneth C. Wendel, Assistant Secretary

  
David B. Norris, Jr., Vice President

STATE OF NEW JERSEY

County of Somerset

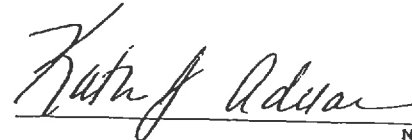
ss.

On this 1st day of October, 2012 before me, a Notary Public of New Jersey, personally came Kenneth C. Wendel, to me known to be Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY, the companies which executed the foregoing Power of Attorney, and the said Kenneth C. Wendel, being by me duly sworn, did depose and say that he is Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of the By-Laws of said Companies; and that he signed said Power of Attorney as Assistant Secretary of said Companies by like authority; and that he is acquainted with David B. Norris, Jr., and knows him to be Vice President of said Companies; and that the signature of David B. Norris, Jr., subscribed to said Power of Attorney is in the genuine handwriting of David B. Norris, Jr., and was thereto subscribed by authority of said By-Laws and in deponent's presence.

Notarial Seal



KATHERINE J. ADELAAR  
NOTARY PUBLIC OF NEW JERSEY  
No 2316685  
Commission Expires July 16, 2014

  
Notary Public

#### CERTIFICATION

Extract from the By-Laws of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY:

"All powers of attorney for and on behalf of the Company may and shall be executed in the name and on behalf of the Company, either by the Chairman or the President or a Vice President or an Assistant Vice President, jointly with the Secretary or an Assistant Secretary, under their respective designations. The signature of such officers may be engraved, printed or lithographed. The signature of each of the following officers: Chairman, President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary and the seal of the Company may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such power of attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached."

I, Kenneth C. Wendel, Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY (the "Companies") do hereby certify that

- (i) the foregoing extract of the By-Laws of the Companies is true and correct,
- (ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U.S. Treasury Department; further, Federal and Vigilant are licensed in Puerto Rico and the U.S. Virgin Islands, and Federal is licensed in American Samoa, Guam, and each of the Provinces of Canada except Prince Edward Island; and
- (iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Warren, NJ this 3 day of July, 2013



  
Kenneth C. Wendel, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT ADDRESS LISTED ABOVE, OR BY Telephone (908) 903- 3493 Fax (908) 903- 3656  
e-mail: surety@chubb.com

**EXHIBIT A**

**DESIGN-BUILD CRITERIA  
AND  
SCOPE OF WORK**

DIA Data Center

Contract Number 201310374

June 2013

**DEPARTMENT OF AVIATION  
City & County of Denver**



**DENVER INTERNATIONAL AIRPORT**

AIRPORT INFRASTRUCTURE MANAGEMENT

# EXHIBIT A

## DESIGN-BUILD CRITERIA AND SCOPE OF WORK

### Denver International Airport DIA Data Center Contract Number 201310374

#### 1.0 Project General Requirements

- 1.1. Denver International Airport ("DIA" or "Owner") is proceeding with the design-build development of a new primary DIA Data Center (the "Project") that is concurrently maintainable. The new Data Center shall allow for planned or unplanned problem or maintenance events which will not impact services or data center operations. Data Center shutdowns for routine maintenance will not occur.
- 1.2. The Data Center shall be a "Modular Building" solution that meets the Project Budget, Project Schedule and Project Program Criteria. Factory-built buildings and structures that are manufactured, sold, offered for sale or occupied for the Project and the Design-Build Contractor intends to use for the Project, shall comply with Colorado State Resolution 35 – Factory-Built Non-Residential Program, and must display insignias issued by the Division of Housing certifying that the structures or units are constructed in compliance with the Resolution. A Modular Building is defined as follows:
  - 1.2.1. Whole building units prefabricated under controlled conditions and delivered to the construction site. These units are manufactured and assembled off-site then shipped in whole or in part to the construction site to complete a finished unit. Usually they are erected on a foundation that is constructed ahead of delivery then assembled in large sections or as largely completed units less final systems connections to civil infrastructure and site utilities.
- 1.3. The Data Center shall provide Tier III service, as defined by The Uptime Institute, to any airport department that requires data center space.
- 1.4. The Data Center shall achieve and be certified for LEED® Silver Certification with the goal of achieving LEED® Gold Certification, through the Green Building Certification Institute (GBCI), U.S. Green Building Council (USGBC), under the LEED® 2009 Rating System or the most current at time of Project registration.
- 1.5. The Data Center Project shall participate in the Xcel Rebate Program. During the Programming and Schematic Design phase, the Design-Build Contractor and its Design Consultant Team shall assist the Owner and coordinate with Xcel Energy to identify a rebate strategy that benefits the Project most without compromising the Project Budget, Project Schedule and Project Program Criteria.
- 1.6. The Data Center design and construction shall be delivered using a fully collaborative Building Information Modeling (BIM) process in accordance with DIA Design Standards Manual Volume 12, Data Submittal, CADD, GIS, BIM & Metadata. This process will incorporate Civil engineering disciplines as well as vertical disciplines, engaged in design and construction.
- 1.7. The Data Center shall minimize Capital Expenditures (CAPEX) by right-sizing an appropriate design which will support current and near-term needs and which will support future expansion, and shall minimize Operating Expenditures (OPEX) by utilizing highly efficient power and cooling.

2.0 **Project Background**

- 2.1. DIA's existing data center spaces are approaching the service capacity in both electrical and mechanical availabilities and these capacity issues will reduce DIA Technologies Division's ability to effectively address all future internal and external customer requirements within the existing data center facilities. While space is currently not the main problem for facility upgrade, limitations exist that cannot be overcome without costly improvements. In some cases, upgrades are not possible to resolve the issues. To better utilize DIA facilities, some existing data center spaces currently used to house IT equipment will be consolidated into a primary data center. This will provide Tier II concurrently maintainable service to any airport department that requires data center space.

3.0 **Project Budget**

- 3.1. The City agrees to pay the Design-Build Contractor for the performance and completion of all the work set forth in this Exhibit A. The amount to be paid by the City to the Contractor under this Design-Build Contract shall be the Negotiated Fixed Contract Price as set forth in Exhibit C and shall not exceed **Nine Million Four Hundred Forty Thousand Three Hundred Sixty Four Dollars (\$9,440,364.00)**.
- 3.2. **Design-Build Contractor Project Budget Verification**
- 3.2.1. The Design-Build Contractor guarantees and warrants that the Project will be completed by its performance under the Negotiated Fixed Contract Price. In no event will the City's liability exceed the Fixed Contract Price, as adjusted by duly authorized change order(s) in accordance with the Design-Build Contract. The Design-Build Contractor is not authorized to commence the Project prior to its receipt of the Notice to Proceed. Any work performed for the Project prior to the issuance of the Notice to Proceed is at the Design-Build Contractor's sole risk.

4.0 **Project Schedule**

- 4.1. The design and construction for the Project, as set forth in the Exhibit A -1 Project Schedules and Milestones, shall be substantially completed in **no more than 289 calendar days** after issuance of a written Notice to Proceed (NTP) to the Design-Build Contractor. The Data Center facility shall be substantially completed, building(s) and structure(s) inspected, all building systems inspected, tested and commissioned, and can be occupied or utilized for the purpose for which it is intended, and ready for IT equipment installation, IT implementation and migration. IT equipment installation, IT implementation and migration are beyond the Design-Build Contractor's scope.
- 4.1.1. Due to this reduced timeline for construction, the Data Center shall be a "modular building" solution that is pre-designed, pre-engineered and fabricated under controlled conditions, and shall meet the Project Budget, Project Schedule and Project Program Criteria as presented in the proposal. The building units are manufactured and assembled off-site then shipped in whole or in part to the construction site to complete a finished unit. The building units are erected on a foundation that is constructed ahead of delivery then assembled in large sections or as largely completed units less final systems connections to civil infrastructure and site utilities. Mobility of the Data Center solution is not a requirement.
- 4.2. Upon Substantial Completion and acceptance by Owner, the Design-Build Contractor shall complete the remaining work to achieve Final Completion. Such remaining work includes, but is not limited to, punch list items, Operations and Maintenance (O&M) Training, Project Contract closeout, all post occupancy activities required for LEED® Certification, and completion of LEED® Certification.

**5.0 Project Program Criteria**

**5.1. General**

- 5.1.1. The Data Center shall be concurrently maintainable, allowing for planned or unplanned problem or maintenance events which will not impact services or data center operations. Data center shutdowns for routine maintenance will not occur. The Data Center must remain available during routine maintenance as well as unexpected events, such as the failure of an air conditioning unit or a UPS. The Data Center shall have redundancy within the data center systems, with no single points of failure at the data center systems level. The Data Center shall be designed and constructed to meet Tier II Concurrent Maintainability as defined by The Uptime Institute.
- 5.1.2. The Data Center shall comply with NFPA 75 – Standard for the Protection of Information Technology Equipment, and all NFPA requirements for data centers.
- 5.1.3. The Data Center shall utilize natural, mechanical and/or electrical resources to reduce environmental impact and reduce overall operational costs to Owner. The Data Center shall achieve and be certified for LEED® Silver Certification with the goal of achieving LEED® Gold Certification, through the Green Building Certification Institute (GBCI), U.S. Green Building Council (USGBC), under LEED® 2009 Rating System or the most current at time of Project registration.
- 5.1.4. The Data Center site planning and design shall provide sufficient site area with expandable mechanical and electrical capacity to support DIA Technologies Division expansion needs for a minimum of 15 years, or approximately double in area of the Data / Server Room.

**5.2. Data Center Site Location**

- 5.2.1. The proposed Data Center site is located south of the Airport along Valley Head Street, near the east end of the Mt. Elbert Parking Lot. This location is in close proximity to many of the utilities anticipated to be needed to support the Data Center facility.
- 5.2.2. It is the Design-Build Contractor's and its Design Consultants' full responsibility to verify all existing utilities as required for the final design and construction of the Data Center.

**5.3. Data Center Site Development**

- 5.3.1. The Data Center Site Development includes all earthworks and site works necessary for the Data Center facility, including site planning for future expansion. Such earthworks and site works shall include, but not be limited to, legal survey, soils report, erosion control, site clear and grub, site grading, strip and stockpile of topsoil, site drainage, perimeter berm(s) if applicable, perimeter security fencing, soil excavation, site lighting, paving, seeding, signage and parking (including pavement markings).
- 5.3.2. All earthworks and site works shall be performed in accordance with the LEED® Design and Construction requirements and LEED® boundary that are to be developed and defined by the Design-Build Contractor and its Design Consultants.

**5.4. Data Center Facility, Building and Structure**

- 5.4.1. The Project Program Criteria and Design Requirements for the Data Center Facility, the associated modular building and structural components, and all

## **Exhibit A - Design-Build Criteria and Scope of Work**

modular service components, are defined in the Exhibit A Data Center Technical Solution, attached hereto and made a part of this Exhibit A.

### **6.0 Design-Build Contractor General Representations and Obligations**

- 6.1. Denver International Airport is proceeding with the design-build development of a new primary DIA Data Center (the "Project"). Owner has engaged the services of a Design-Build Contractor to provide comprehensive design-build services for the design and construction of the new Data Center, procurement of the Modular Building(s) and coordination with Modular Building provider on all associated design / delivery / installation, facility and system commissioning, sustainable design and construction, LEED® administration and certification, facility certification by governing code authorities, the operational start-up, and Project Contract closeout.
- 6.2. The Design-Build Contractor represents that it is qualified and experienced in performing design-build services on similar projects and represents that it is knowledgeable and hereby undertakes the Project development that is in compliance with all applicable and non-conflicting federal, state and local laws, codes, ordinances, rules, regulations, applicable environmental permits, the facility program criteria, and design and construction standards applicable to the Project.
- 6.3. The Design-Build Contractor represents that it understands the full extent of its responsibilities and that it has the ability, expertise, experience, labor and materials, and resources to complete all of the work necessary to deliver the Project in compliance with the contract requirements.
- 6.4. The Design-Build Contractor and its Design Consultants shall assist and prepare all documentation necessary for DIA Planning Department to submit and apply for the Federal Aviation Administration (FAA) Form 7460 – NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION. The Design-Build Contractor acknowledges that the approval of the 7460 by FAA can take up to 120 days and no construction can be executed without the 7460 approval.

### **7.0 Design-Build Contractor's Specific Scope of Work and Services**

#### **7.1. General**

- 7.1.1. The term "Project" when it is used in this Design-Build Criteria and Scope of Work means all the work associated with the Design-Build Contract for the DIA Data Center. This includes, but is not limited to, the coordination between Owner Program / Project Managers and all internal and external stakeholders, the development of Project schedules, schedule progress monitoring in all design and construction phases, design quality control reviews and compliance with applicable DIA design standards, program criteria and performance specifications, establishment and administration of a construction control assurance program, establishing a facility and system commissioning procedure in conjunction with the system commissioning efforts, facilitate certificate of occupancy acceptance by governing code authorities and LEED® administration and certification.
- 7.1.2. The Design-Build Contractor shall be responsible for the complete design and construction of the Data Center up to the Server Racks (with appropriate PDU's), including the mechanical, electrical and all works necessary for proper functioning of the facility and Server Racks (with appropriate PDU's). IT equipment installation, IT implementation and migration are to be provided, installed, and commissioned by DIA Technologies Division and are beyond the scope of this RFP.

**7.2. Design and Preconstruction Services**

- 7.2.1. The Design-Build Contractor shall provide professional design and engineering services and preconstruction services for the Project. Such services include, but are not limited to, design and construction coordination, sustainability design, construction scheduling and cost estimating, constructability reviews, value engineering, construction phasing and interface, etc. The Designer component of the Design-Build Contractor must be architect(s) or professional engineer(s) licensed and registered in the State of Colorado. The Contractor component of the Design-Build Contractor must be a licensed contractor in the City and County of Denver in order to perform all of the work for the Project.
- 7.2.2. The design, construction and closeout for the Project shall be delivered in Building Information Modeling (BIM) in accordance with DIA Design Standards Manual Volume 12, Data Submittal, CADD, GIS, BIM & Metadata. The Design-Build Contractor and its Design Consultants shall integrate BIM as a process and deliverable into the DIA organizational and planning structure and take advantage of the data information created during design and construction to enhance and feed into facilities / operations processes.
- 7.2.3. The Design-Build Contractor shall engage in a collaborative process to define the DIA BIM Project Execution Plan (BPXP) requirements and deliverables for the Design, Construction, and Closeout phases of the project.
- 7.2.4. The Design-Build Contractor shall provide all professional architectural, engineering, sustainability, consulting services, and all construction contracting and activities necessary for the completion of the Project, which shall include, but is not limited to, the following.
  - 7.2.4.1. Programming
  - 7.2.4.2. Sustainability and Life Cycle
  - 7.2.4.3. Civil Engineering
  - 7.2.4.4. Site Survey
  - 7.2.4.5. Geotechnical Engineering
  - 7.2.4.6. Architectural Design
  - 7.2.4.7. Structural Engineering
  - 7.2.4.8. Mechanical Engineering
  - 7.2.4.9. Plumbing Engineering
  - 7.2.4.10. Fire Protection and Life Safety
  - 7.2.4.11. Electrical Engineering
  - 7.2.4.12. Cathodic Protection
  - 7.2.4.13. Communications and Data Systems Engineering
  - 7.2.4.14. Interior and Exterior Lighting Engineering
  - 7.2.4.15. Lightning Protection
  - 7.2.4.16. Signage
  - 7.2.4.17. Security Systems (Access Control, CCTV) Engineering
  - 7.2.4.18. Specialty Systems

**7.3. Design-Build Contractor Deliverables**

## Exhibit A - Design-Build Criteria and Scope of Work

- 7.3.1. The Design-Build Contractor Deliverables are set forth in Exhibit A-1 Project Schedule and Milestones under this Design-Build Contract.
- 7.3.2. The design, construction and closeout for the Project shall be delivered in Building Information Modeling (BIM) in accordance with DIA Design Standards Manual Volume 12, Data Submittal, CADD, GIS, BIM & Metadata. The Design-Build Contractor and its Design Consultants shall integrate BIM as a process, define and provide deliverables into the DIA organizational and planning structure and take advantage of the data information created during design and construction to enhance and feed into facilities / operations processes.
- 7.3.3. Owner reserves the right to reject any and all deliverables, or any portion of the deliverables, which is in the sole opinion of Owner, do not adequately represent the intended level of completion or standards of performance, do not include relevant or accurate information or data, or do not include all documents specified or reasonably necessary for the purpose for which the Agreement is made with the Design-Build Contractor or for which Owner intends to use the deliverables.
- 7.3.4. **Design Documents**
  - 7.3.4.1. Upon Agreement and issuance of the written Notice to Proceed (NTP), the Design-Build Contractor will commence the Project and develop the Design Documents as set forth in the Exhibit A-1 Project Schedules and Milestones.
  - 7.3.4.2. Federal Aviation Administration Form 7460 NOTICE OF PROPOSED CONSTRUCTION OR ALTERATION - The Design-Build Contractor shall prepare and provide to Owner the necessary Project information for the application of the 7460 for FAA approval. Such information includes, but not limited to, proposed building(s) coordinates, proposed building(s) height(s), proposed construction crane(s) information (type, maximum height, etc.) for the Project, construction duration, etc. The Design-Build Contractor acknowledges that the approval of the 7460 by FAA can take up to 120 days and no construction can be executed without the 7460 approval. The Design-Build Contractor also acknowledges that the approval of the 7460 is critical to the Project schedule.
  - 7.3.4.3. All Design Documents shall be submitted to Owner for review and approval, and shall include the Project Budget and Schedule. All Design Documents shall be developed in accordance with the DIA Design Standards Manual (DSM) 1 and shall include construction cost estimate and schedule, and Design Analysis Report (DAR) as defined in the DIA Design Standards Manual (DSM) 1.
  - 7.3.4.4. If Owner enters into the construction part of this Design-Build Contract, the Design-Build Contractor and its Design Consultants shall provide Issue for Construction Documents and all permit review documents as required for City and County of Denver, Development Services reviews and permit applications, and construction services for the Project from mobilization through full construction completion. The Design-Build Contractor and its Design Consultants, as required, shall provide and revise design documents and specifications detailing the requirements for construction of the Project. Construction services shall include, but not limited to, construction management, contract administration, cost and schedule control, subcontractor procurements and bids, scheduling, design and construction coordination, quality control, testing,



## **Exhibit A - Design-Build Criteria and Scope of Work**

submittals processing and review, systems commissioning, distribution of product warranties, training and Owner manuals, LEED® documents and administration, Project record drawings, and Project Contract closeout.

### **7.4. Denver International Airport Design Standards Manuals**

7.4.1. The DIA Design Standards Manuals (DSM) defines the project requirements for architectural and engineering development of designs and design documents, technical performance specifications that are part of the Design-Build Contract. The Design-Build Contractor and its Design Consultants shall become familiar with these requirements and monitor the Project's detailed development and adherence to those requirements applicable to the Project. The Design-Build Contractor shall identify all design and construction deficiencies in the adherence to those standards and performance criteria. The Design-Build Contractor shall bring those design and construction deficiencies to the attention of the Owner. The Design-Build Contractor shall coordinate with the Owner to develop plans and / or procedures to bring the Project designs and construction activities into compliance with the contract requirements.

### **7.5. City and County of Denver, Department of Aviation, Department of Public Works, Standard Specifications For Construction General Contract Conditions**

7.5.1. The City and County of Denver, Department of Aviation, Department of Public Works, Standard Specifications for Construction General Contract Conditions are part of the Design-Build Contract for Construction of the Project. The Design-Build Contractor shall become familiar with these general contract conditions and monitor the adherence to the requirements. The Design-Build Contractor shall identify all Design-Build Contractor construction variances from these general conditions. The Design-Build Contractor shall bring those variances to the attention of the Owner. The Design-Build Contractor shall coordinate with the Owner to develop plans and / or procedures to bring the Project into compliance with these general conditions.

### **7.6. Special Conditions**

7.6.1. The Design-Build Contract contains Special Conditions that are specific to the Project and modifications to City and County of Denver, Department of Aviation, Department of Public Works, Standard Specifications for Construction General Contract Conditions. The Design-Build Contractor shall become familiar with these special conditions and monitor the adherence to the requirements. The Design-Build Contractor shall identify all Design-Build Contractor construction variances from these special conditions. The Design-Build Contractor shall bring those variances to the attention of the Owner. The Design-Build Contractor shall coordinate with the Owner to develop plans and / or procedures to bring the Project into compliance with these special conditions.

### **7.7. Technical Specifications Division 1 General Requirements**

7.7.1. The Design-Build Contract contains standard set of technical specifications, Division 1 General Requirements for construction. The Division 1 requirements establish the specific construction, operations, and DIA operational requirements for the Project, and the Design-Build Contractor must adhere to the requirements while executing the construction of the Project. The Design-Build Contractor shall become familiar with these general requirements and understand the impacts these requirements have on the Project. As the Design-Build Contractor develops the construction documents for the Project, the Owner will have the responsibility for the modification of the Division 1

## Exhibit A - Design-Build Criteria and Scope of Work

General Requirements to outline the specific requirements for the construction phase of the Project. The Owner shall produce the final set of Division 1 General Requirements for the Project, and the Design-Build Contractor shall comply with the general requirements.

- 7.7.2. Technical Specifications shall be prepared in accordance with DIA Design Standards Manual Volume 12, Data Submittal, CADD, GIS, BIM & Metadata.

### 7.8. Technical Specifications Divisions 2 – 48 and Contract Drawings

- 7.8.1. During the design process for the Project, the Design-Build Contractor shall produce the construction technical specifications Divisions 2 through 48 per CSI MasterFormat® 2012, and contract drawings. The Design-Build Contractor may develop separate bid packages for separate portions of the Project. The Design-Build Contractor shall review technical specifications and drawings for any and all bid packages for compliance with all contract requirements. The Design-Build Contractor, through its design and construction quality assurance programs, shall monitor the Project development, identify deficiencies and make all necessary corrections to bring the technical specifications and drawings to compliance with the contract requirements.

- 7.8.2. Technical Specifications and Contract Drawings shall be prepared in accordance with DIA Design Standards Manual Volume 12, Data Submittal, CADD, GIS, BIM & Metadata.

### 7.9. Project Management Plan

- 7.9.1. The Design-Build Contractor shall coordinate with the Owner in developing and maintaining a Project Management Plan (PMP) in electronic format that outlines the responsibilities of the Design-Build Contractor, its Design Consultants, Subcontractors, and the Owner. Based on the Project Schedule, the PMP must identify time periods for which critical activities must take place. The PMP shall describe all reviews and approvals, and the timeframes, which are required by the Owner and other governmental agencies.

### 7.10. Project Deliverable Coordination Report

- 7.10.1. The Design-Build Contractor shall prepare and submit to Owner a Project Deliverable Coordination Report in electronic format for each deliverable for the Project. At a minimum, the Project Deliverable Coordination Report shall include the following.

7.10.1.1. Master Program Schedule

7.10.1.2. Master Program Budget

7.10.1.3. Progress Report

7.10.1.4. Work Breakdown Structure (WBS) for Construction and Procurement

7.10.1.5. Responsibility Matrix

### 7.11. Project Monthly Report

- 7.11.1. The Design-Build Contractor shall prepare and submit a monthly report to the Owner in electronic format, which shall briefly describe the progress of the various phases and all activities necessary for the completion of the Project. At a minimum, the monthly report shall cover the following.

7.11.1.1. Overall Project Progress

- Executive Summary
- Project Budget Summary

## Exhibit A - Design-Build Criteria and Scope of Work

- Project Overall Progress
- Project Master Schedule

7.11.1.2. Project Design and Construction Issues

7.11.1.3. Project Construction and Procurement

7.11.1.4. Potential Schedule Impacts

7.11.1.5. Project Management Activities

### 7.12. Project Schedule Management

- 7.12.1. The Design-Build Contractor shall develop and maintain a Master Project Schedule for the Project. The Master Project Schedule shall be developed in Primavera P 6 or Primavera Contractor format consistent with the Project requirements. The Master Project Schedule shall incorporate all activities necessary to complete the design and construction of the Project.

### 7.13. Project Control

- 7.13.1. The Design-Build Contractor will be required to use Primavera Contract Management (PCM) and Primavera P6 as part of the Project Control System. This system will allow management and compilation of all data and analysis related to schedule, costs, labor, design and construction documents preparation needed to effectively manage the construction, systems commissioning and start-up and operational start-up of the facility. The Owner will be responsible for providing the licensing and training for PCM. The Design-Build Contractor will be responsible for providing Primavera P 6. In association with this and in order to ensure that the Design-Build Contractor has a proper operational Project Controls system, they shall be responsible for procuring and installing the following software; Microsoft Internet Explorer, Java JRE 1.6.0 Update 20 and Adobe Acrobat X Pro. No other type of management system will be accepted for use for this activity. The preliminary criteria and organization of the Program Controls shall be submitted to the Owner for approval after the Design-Build Contractor receives their Notice to Proceed.
- 7.13.2. As a minimum, the Project Controls System shall include: a work breakdown structure with roll-up capabilities sufficient to allow meaningful cross-referencing and interrelating of the various components of work necessary to complete the Project. The Design-Build Contractor will utilize Primavera Contract Management, which will be provided by the Owner, as the tracking system for all correspondence, drawings, procurement contracts and purchase orders, delivery schedules, reviews and approvals and approvals for construction, etc. A communication / distribution matrix shall be established to determine how and to whom information will be distributed.
- 7.13.3. In conjunction with the Owner, the Design-Build Contractor shall assist in the development of the Project Master Budget. The Design-Build Contractor shall be responsible for using Primavera Contract Management as the tool for administering and monitoring cost controls for the project. The system shall be used to produce timely cash flow reports and forecasts and to identify variances between planned and actual costs. The Design-Build Contractor will advise the Owner as to whether or not the Project Budget is being met or exceeded during design and construction, and shall promptly advise the Owner in writing whenever it appears that the budget could be exceeded, including the Design-Build Contractor's recommendation for actions that will bring the budget into approved limits.

## **Exhibit A - Design-Build Criteria and Scope of Work**

- 7.13.4. A detailed budget for each project element will be included in the Design-Build Plan. Budgets will be identified and managed for the following:
  - 7.13.4.1. Design-Build Contractor
  - 7.13.4.2. Design Management
  - 7.13.4.3. Construction Management
  - 7.13.4.4. Construction
  - 7.13.4.5. Quality Assurance material testing and Inspections
  - 7.13.4.6. Data and Communications Systems
  - 7.13.4.7. All other project systems
- 7.14. **Communications**
  - 7.14.1. The Design-Build Contractor shall schedule meetings as necessary and all meetings will be held in a consistent manner both in terms of time and place in order to allow all participants to plan accordingly. An agenda will be distributed to all participants prior to a meeting. The Design-Build Contractor shall not schedule multiple meetings on the same day or concurrent meetings, whenever possible.
  - 7.14.2. The Design-Build Contractor shall hold regular weekly meetings between the Owner Staff, consultants and contractors and shall develop effective procedures to coordinate the interests of the Project's various stakeholders.
  - 7.14.3. The Design-Build Contractor shall make full use of the latest communication systems and software to collect and distribute information to all meeting participants. The Design-Build Contractor will establish hardware and software standards in coordination with the Owner.
- 7.15. **Design Review**
  - 7.15.1. Upon review of the programming criteria the Design-Build Contractor shall recommend to the Owner, for their consideration, any modifications to the project's design which may enhance the Design-Build Contractor ability to achieve scope, quality, budget, and schedule objectives. The recommendations shall be consistent with the status of the project and should only include items that the Design-Build Contractor considers critical to the success of the Project.
- 7.16. **Value Engineering**
  - 7.16.1. The Design-Build Contractor shall perform, as required, value-engineering exercises in conjunction with the Owner. The exercises will evaluate design alternatives by comparing performance criteria with initial and operating costs and scheduling utilizing Federal VE guidelines, if applicable, and will identify the high cost or "problem" areas during its review of the design phase drawings. The VE review shall evaluate the proposed systems, products and construction methods, initial vs. life cycle cost and impacts on the construction schedule and project development.
- 7.17. **Constructability Review**
  - 7.17.1. The Design-Build Contractor shall perform a constructability review to include, but not limited to the following; potential design conflicts, design and construction alternative analyses, field construction issues, systems compatibility, material availability, logical and efficient construction sequencing, coordination between construction packages, Owner furnished equipment, airport security, maintenance of airport operations, construction document

## **Exhibit A - Design-Build Criteria and Scope of Work**

details, maintenance considerations, quantity verification, quality control and testing requirements, scheduling requirements, site safety and security, staging and laydown areas.

### **7.18. Technical Specifications and Construction Drawings Review**

7.18.1. The Design-Build Contractor's input will consist of the following:

7.18.1.1. Regularly review of in-progress construction documents to ensure adherence to the approved design development documents, budget and schedule.

7.18.1.2. Value engineering input as necessary.

7.18.1.3. Document scope / quality review.

### **7.19. Scope Change Management**

7.19.1. The Design-Build Contractor shall review request for changes, coordinate Owner requested changes, coordinate the periodic production of the Project accounting reports showing the original budget, revised budget, original contract, change orders, current contract, anticipated change orders, and estimated cost to complete the Project, provide cost payment status reports including status of project reserve, and monitor and report on expenditures.

7.19.2. Furnish the Owner with detailed documentation of the total project cost suitable for third party audits at the completion of the Project.

### **7.20. Documentation**

7.20.1. The Design-Build Contractor shall develop and administer a comprehensive program to "punchlist" the Project. The program shall include all aspects of the general construction, mechanical, electrical, communications, data and customer service systems. Other groups may have primary responsibility for developing various punchlist, in those cases, the Design-Build Contractor shall track those activities to ensure that the list is being addressed so as not to impact the Project's completion.

### **7.21. Substantial Completion**

7.21.1. The Design-Build Contractor shall coordinate with the Owner the filing of Notices of Substantial Completion, coordinate the delivery of maintenance and warranty data for operations and facility records, and coordinate with designers, engineers, subcontractors and manufacturers all checkouts of utilities; operations system and equipment as well as initial start-up and testing.

7.21.2. The Owner shall make a determination of Substantial Completion when it is confirmed that all systems and finishes are complete. The Owner, along with the Design-Build Contractor, will also make a determination of operational readiness for the Project. The Owner shall oversee the final inspection of the Project.

### **7.22. Final Completion**

7.22.1. The Design-Build Contractor shall communicate with the Owner when work is ready for final inspection, obtain Certificates of Occupancy from all required code and approval agencies, request payment of retention upon completion of all the items of work, and provide complete project budget reconciliation for project audit.

### **7.23. Facility Records**

## **Exhibit A - Design-Build Criteria and Scope of Work**

- 7.23.1. The Design-Build Contractor shall deliver to the Owner all as-built and record documents; operations manuals; equipment, materials and systems warranties, shop drawings, submittals documents, and all documents as required for LEED® Certification.
- 7.23.2. The Division 1 specifications shall describe the necessary Design-Build Contractor procedures and formatting methods.

### **7.24. Design and Construction Control**

- 7.24.1. As part of its base fee for services, the Design-Build Contractor will establish and administer a construction quality control inspections program to ensure that the Project components, systems and facilities are being designed, constructed and installed according to the contract documents and all applicable codes, design standards, performance specifications and regulations. The quality control program shall outline procedures for design document development reviews, materials testing, Project inspections and all field quality assurance inspections procedures.
- 7.24.2. The Design-Build Contractor's construction quality control inspections personnel shall perform inspections, coordinate and manage the activities of the quality control materials testing agency for all necessary inspections.
- 7.24.3. Quality Assurance during construction encompasses those activities required to ensure the Owner that contractor provided Quality Control programs are existent, implemented and effective, and verify and provide adequate documentation that all materials used and techniques employed regarding facilities and/or systems constructed for the Project are in accordance with construction contract drawings and specifications.

### **7.25. Control of Special Processes**

- 7.25.1. Construction processes or techniques requiring special Quality Control procedures, by the Design-Build Contractors or their sub-contractors and suppliers, such as welding, heat treating, hydrostatic testing, nondestructive examination, cable high potential testing, etc., shall have Quality Assurance inspections accomplished by qualified personnel using written procedures prepared in accordance with contract drawings and specifications and the referenced codes and standards which have been submitted to the Owner for review and acceptance. Prior to the start of the special process, the quality control inspectors will ensure the procedure to be used for the special process, as well as the qualification records of personnel performing the special process, have been submitted and accepted. Adequate information regarding the impact, or potential impact, of the process or processes, materials tested and/or the materials required for the test or tests on human health or the environment, shall be documented in advance to the Safety Manager.

### **7.26. Independent Materials Testing Agency (IMTA)**

- 7.26.1. The Owner shall administer an Independent Materials Testing Agency contract to provide the independent testing as required by the contract documents. The Design-Build Contractor shall coordinate its activities with the Independent Materials Testing Agency to be sure that the necessary coverage is provided when needed for all independent test required by the contract documents.

### **7.27. Shop Drawings and Submittals**

- 7.27.1. The Design-Build Contractor, without assuming the duties and responsibilities of their Design-Build subcontractors, shall review the shop drawings and submittals on a Quality Assurance basis to make certain that all required shop drawings have been timely approved or otherwise acted upon by the

## **Exhibit A - Design-Build Criteria and Scope of Work**

appropriate parties, and shall ascertain that the materials delivered to the site generally conform to the shop drawings and the design parameters. If the Design-Build Contractor believes these criteria are not being met, it shall report its findings to the Owner and follow up to ensure such issues are properly addressed.

### **7.28. Systems Commissioning and LEED® Commissioning**

- 7.28.1. Systems commissioning is a systematic and BIM-Based process of achieving, verifying and documenting that the performance of all of the Project's systems perform interactively according to the design intent and the functional and operational needs of the Project. The Design-Build Contractor shall, based upon its experience managing a Project of this scope and complexity shall coordinate with the Owner's systems commissioning program and such systems include, but not limited to, plumbing, cathodic protection, HVAC, fire alarm and detection, fire protection, mechanical, electrical, lighting, telecommunications, security systems, etc. The design, operating intent and code operational requirements of the various Project systems must be determined and procedures developed to test all systems through the range of functional scenarios, which the systems must respond properly. The development of the commissioning process shall begin with the design phase and implemented during construction and carry through to close-out, testing, start-up and in conjunction with the Design-Build contractor, training of maintenance personnel on proper systems operations. The Design-Build Contractor shall witness and record the results of all start-up and testing procedures for utilities, facility systems and equipment. The Design-Build Contractor shall also ensure a smooth and timely turnover of all manuals, records, warranties, as-built and record drawings and specifications, and required spare and maintenance materials to the Owner.
- 7.28.2. The Design-Build Contractor shall provide systems commissioning in conjunction with all commissioning services as required for the Project's LEED® Silver Certification as defined in the 2009 LEED® Reference Guide for Green Building Design and Construction and the associated reference standards, or the most current at time of Project registration. Such services include the Fundamental Commissioning of Building Energy Systems (EA Prerequisite 1), Enhanced Commissioning (EA Credit 3), and Building Enclosure Commissioning (BECx), whichever applicable.

### **7.29. Project Closeout**

- 7.29.1. The Design-Build Contractor in conjunction with the Owner shall coordinate the development of punch lists for the Project and will perform the final inspection to verify that the punch list items have been satisfactorily completed.
- 7.29.2. The Design-Build Contractor shall monitor the performance of all subcontractors with respect to the preparation of marked-up drawings to reflect as-built field conditions. The Design-Build Contractor is to maintain redline models and / or drawings as a condition of their progress payments.
- 7.29.3. The Design-Build Contractor shall coordinate and expedite the transmittal of formal record documents to the Owner. The Design-Build Contractor will ensure that all deliverables and submittals required by the design and construction contracts have been completed and transmitted.

### **7.30. Project Acceptance**

- 7.30.1. Upon Substantial and Final Completion, including inspection and commissioning, the Design-Build Contractor shall provide to the Owner with written notice of such completion for DIA review and acceptance. Such notice

## **Exhibit A - Design-Build Criteria and Scope of Work**

shall constitute a representation to the Owner that the Design-Build Contractor has performed all services and other work necessary or required to complete the Project in accordance with this agreement and the standards, requirements and criteria have been fulfilled.

### **7.31. Accounting Records**

7.31.1. The Design-Build Contractor shall keep records of its direct personnel, consultants, subconsultants, subcontractors and reimbursable expenses pertaining to the Project, and records of accounts between the Owner and the Design-Build Contractor. These records shall be available for inspection and audit by representatives of the Owner at mutually convenient times for a period of six (6) years from the date of Final Completion.

### **7.32. Project Construction Site Staffing**

7.32.1. The Design-Build Contractor shall provide an on-site Resident Project Manager during the construction for the Project. The Resident Project Manager shall be the lead contact with the Design-Build Contractor for construction administration. The Resident Project Manager may perform other functions within the Design-Build Contractor's project organization. The Design-Build Contractor's Resident Project Manager shall remain in place during the execution of the construction contract(s) and until the construction contract closeout procedures have been completed. The Resident Project Manager is subject to the approval of the Manager of Aviation. The Design-Build Contractor's Resident Project Manager shall have the authority to act on behalf of the Design-Build Contractor.

7.32.2. The Design-Build Contractor's Resident Project Manager does assume and is not responsible for any of the contractor's construction means, methods, techniques, sequences, procedures or safety precautions in connection with the construction, or for the failure of any of them to perform their work in accordance with the contract documents.

## **8.0 Miscellaneous Contract Requirements**

### **8.1. Ownership of Work Product**

8.1.1. Work product and other documents prepared solely for the Project, whether in tangible or intangible form, including, without limitation, documents, electronic files or computer programs, are works for hire and shall become the property of the City and County of Denver, whether the Project is completed or not. The Design-Build Contractor may retain reproducible copies of such documents so long as the hard copy originals and electronic documents are delivered to the Owner. The Owner may use all documents prepared by the Design-Build Contractor, subconsultants, the Design-Build Contractor or its Subcontractors to complete the Project and for additions to this Project and for other facilities developed by or on behalf of the Owner.

8.1.2. The Design-Build Contractor acknowledges and agrees that all writings or works of authorship, including, without limitation, Project Management Plans, schedules, quality assurance plans and other documents, produced or authored by the Design-Build Contractor, subconsultants, the Design-Build Contractor or any of their respective employees or Subcontractors in the course of performing services for the Owner and developed for the Owner for the Project, together with any copyrights on those writings or works of authorship, are works made for hire and the property of the Owner. To the extent that any writings or works of authorship may not, by operation of law, be works made for hire, this Agreement shall constitute an irrevocable assignment by the Design-Build Contractor to the Owner of the Ownership of, and all rights



of copyright in, such items, and the Owner shall have the right to obtain and hold in its own name rights or copyright, copyright registrations and similar protections which may be available in such works. The Design-Build Contractor agrees to give the Owner or its designees all assistance reasonably required to perfect such rights. All contracts entered into with the Design-Build Contractor and between Subconsultants and Design-Build Contractor and Subcontractors shall contain a provision acknowledging and confirming the Owner's Ownership of all writings and works of authorship as described in this provision.

**8.2. Information Gathering**

8.2.1. The Design-Build Contractor shall include in its professional services fee for the cost of providing personnel at Denver International Airport and County of Denver government offices as needed to gather information, for the Project. This shall include, but is not limited to review of hard copy Project records documents, review of electronic record documents, site investigations, any meetings or discussions with City and County of Denver Development Services, Denver Fire Department, etc. The Design-Build Contractor, with the assistance of the Owner, will be responsible for identifying the necessary documents needed to accomplish its work.

**8.3. Notice to Proceed**

8.3.1. The Owner shall provide a written Notice to Proceed (NTP) to start the Design-Build Contractor's activities under this Design-Build Contract. The Design-Build Contractor will not be authorized to proceed with the work described in Exhibit A, and the Owner shall not be obligated to fund any work performed by the Design-Build Contractor, until the Owner has provided the formal written notification.

**8.4. Airport Security Requirements**

8.4.1. DIA requires personnel badging and vehicle permitting administered by the Denver International Airport Security office. The Design-Build Contractor shall be required to obtain the proper access authorizations for badges and permits. The Design-Build Contractor shall also refer to Technical Specifications, Division 1 – General Requirements for additional information.

8.4.2. The Design-Build Contractor shall obtain an Airport Security Participant Manual from the Airport Security Office and must follow the guidelines in the manual. The Airport Security Participant Manual will be issued after the company has attended a Participant meeting with Airport Security. The Design-Build Contractor shall comply with the Denver Municipal Airport System Rules and Regulations and TSA regulations. The Denver Municipal Airport System Rules and Regulations can be found on the [www.flydenver.com](http://www.flydenver.com) website.

8.4.3. The Design-Build Contractor is required to conform to the security policies as established by Airport Security and TSA. The Project is located in the Public Area on airport property. As such, the project scope has been reviewed by Airport Security which will require that each contractor badge at least one employee. This is to ensure that all contractors have a badged company representative present during any work activity. It shall be the sole responsibility of the Design-Build Contractor to confirm that there are badged personnel on-site during all construction activity to meet this obligation. Failure to comply with this requirement will be in violation of the Denver Municipal Airport Rules and Regulations and could impact the company's ability to operate at DIA.

8.4.4. A C HRC and Security Threat Assessment (STA) are required for each employee requesting unescorted access to the restricted areas. The employee

## **Exhibit A - Design-Build Criteria and Scope of Work**

shall complete the Fingerprinting and Badge Application and schedule an appointment with the Airport Security Office to have the form reviewed and to be fingerprinted. The Federal Bureau of Investigation will conduct the CHRC and will return the results to the Airport Security Office. The Transportation Security Administration will process the STA and will return the results to the Airport Security Office. The Design-Build Contractor is advised that there is a \$40 dollar fee for Criminal History Records Check (per employee) for Unescorted access.

- 8.4.5. Vehicle permits are required for all vehicles operating in the Restricted Area. Vehicles or machinery operating within buildings shall be required to acquire a DIA emissions permit as well as a DIA vehicle permit.

### **8.5. Design-Build Contractor's Personnel Assigned to this Agreement**

- 8.5.1. The Design-Build Contractor and staff shall have experience and knowledge of managing a Project of this scope and complexity. The Design-Build Contractor shall be the contact person in dealing with the DIA's designated representative on matters concerning this Project and shall have the full authority to act for the Design-Build Contractor's. The Design-Build Contractor shall remain on this Project during the entire contract term, while in the employment of the Design-Build Contractor or until such time that his / her performance is deemed unsatisfactory by the Owner and a formal written request is submitted which requests the removal of the Design-Build Contractor.
- 8.5.2. The Design-Build Contractor may submit and the Owner will consider a request for reassignment of a Design-Build Contractor, should the Design-Build Contractor deem it to be in the best interest of the Owner, or in the best interest of the Design-Build Contractor's organization or in the best interest of the Design-Build Contractor's Design-Build Contractor. If the Owner allows the removal of a Design-Build Contractor, the replacement must have, at least, similar or equal experience and qualifications to that of the original individual. The replacement assignment is subject to the approval of the Owner.
- 8.5.3. All key professional personnel identified by the Design-Build Contractor will be assigned by the Design-Build Contractor or sub-consultants to perform work under this Scope of Work. The Design-Build Contractor shall submit to the Owner, for review and approval, a list of any additional key professional personnel who will, under this Design-Build Contract, perform work for the Project, together with complete resumes and other information describing their ability to perform the tasks assigned. It is the intent of the parties hereto that all key professional personnel be engaged to perform their specialty for all such services required by this Scope of Work and that the assigned key professional personnel be retained for the life of this Agreement or until their particular scope of work assignment has been completed.
- 8.5.4. If the Design-Build Contractor decides to replace any of its key professional personnel, it shall notify the Owner in writing of the changes it desires to make. No such replacement shall be made until the Owner approves the replacement in writing. This approval shall not be unreasonably withheld by the Owner. If the Owner or his designated representative does not respond within fifteen (15) days after the receipt of the notification in writing, the key professional personnel replacement shall be approved.

### **8.6. Documentation of Project Meetings**

- 8.6.1. The Design-Build Contractor's Project Manager shall prepare and submit a written report / minutes of any and all meetings concerning the Project between the Owner and the Design-Build Contractor. The written report / minutes must

## **Exhibit A - Design-Build Criteria and Scope of Work**

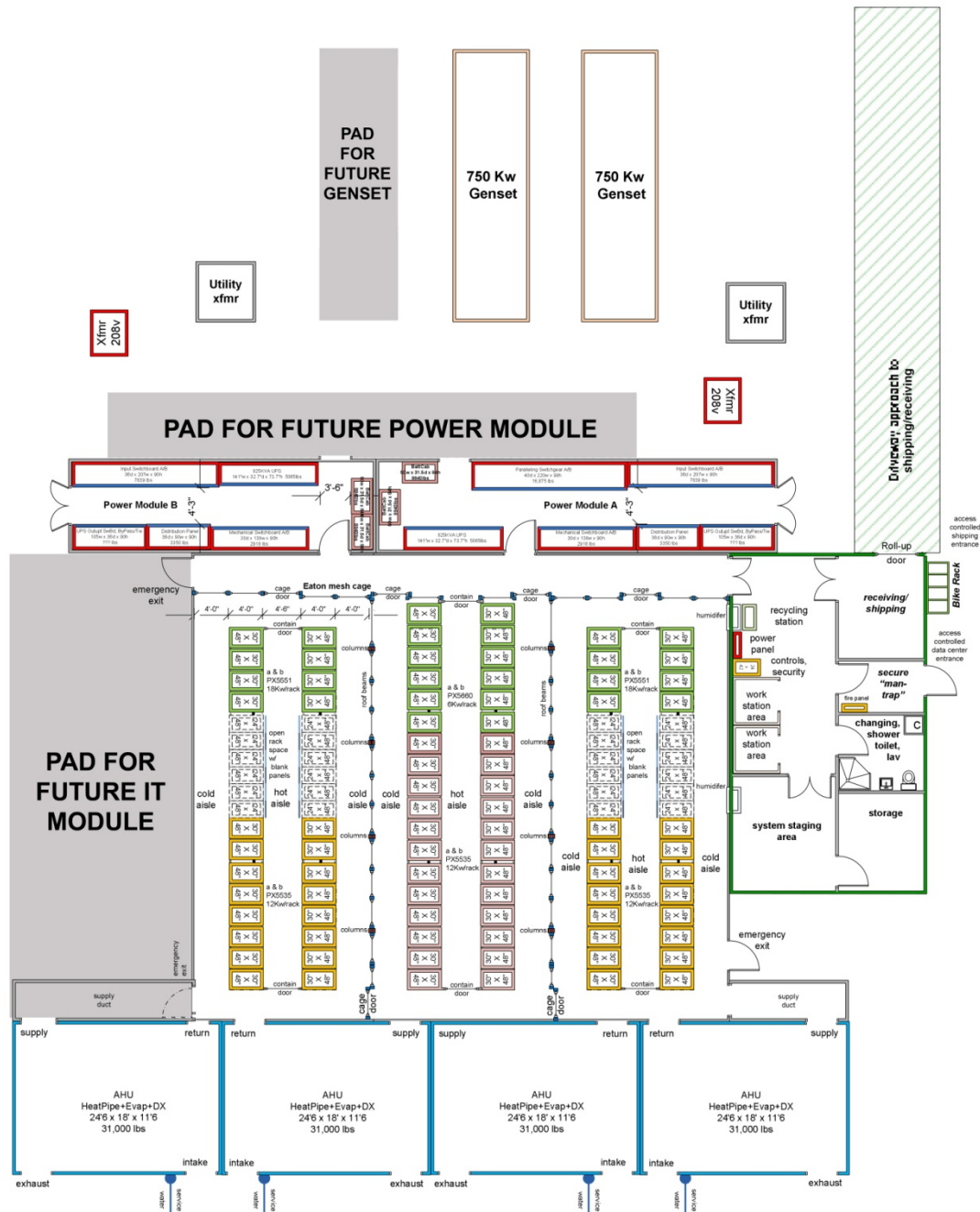
be submitted to the Owner in electronic format, no later than seven (7) days following the meeting.

### **8.7. Design-Build Contractor's Office**

- 8.7.1. The Design-Build Contractor will set up their operations at DIA on site in the contractor's south campus laydown area, for the specific and limited purpose of providing services under this Design-Build Contract. The Design-Build Contractor shall estimate and submit their trailer space requirements to the Owner for space assignment.
- 8.7.2. The Design-Build Contractor shall coordinate with the Owner to identify needs and requirements and arrange for Design-Build Contractor office Internet and e-mail access.

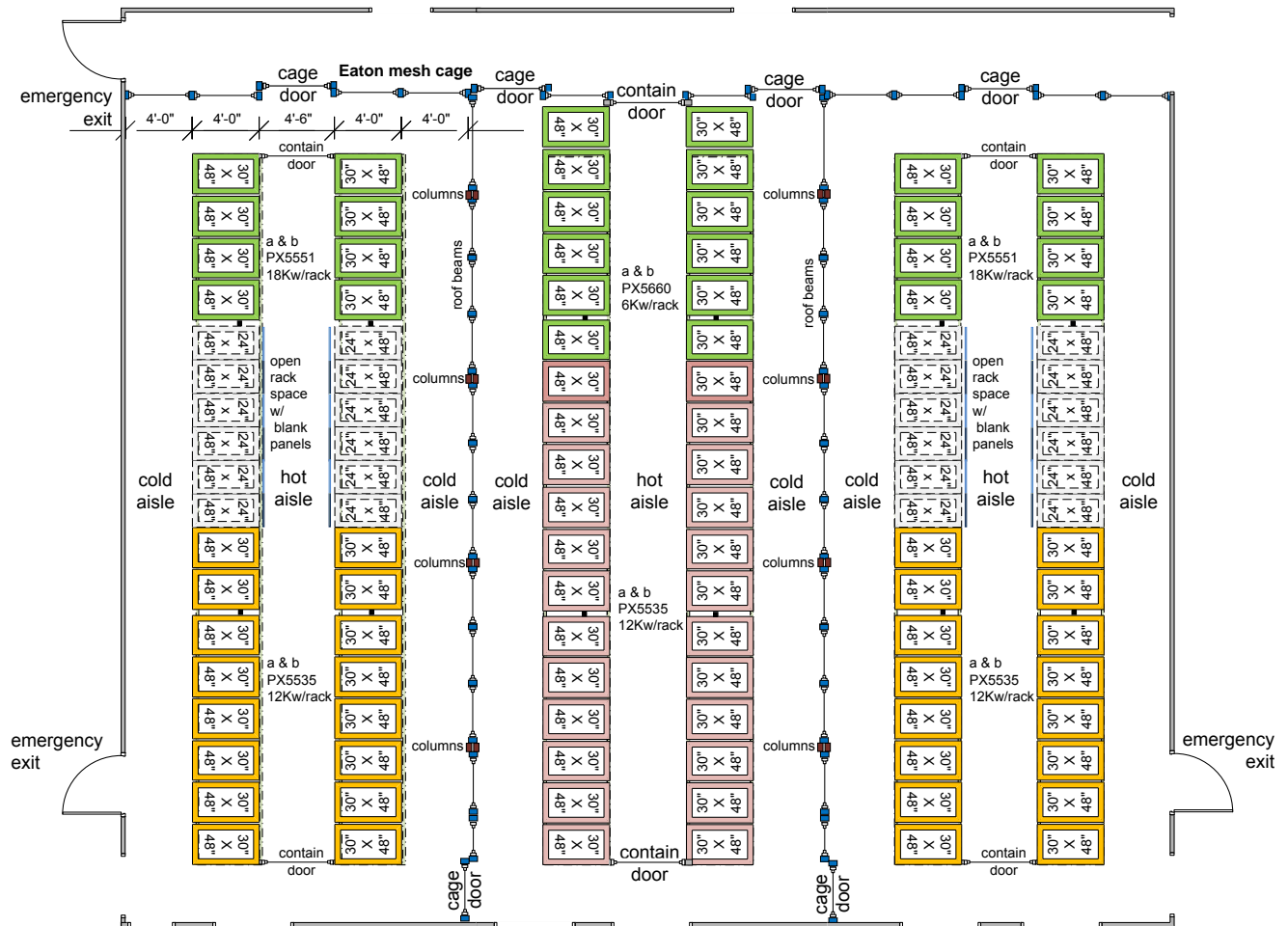
## Data Center Technical Solution

- Data Center Facility Layout



## A. Contiguous Data Center Space

The IT Server space consists of approximately 3,348 square feet of contiguous floor space. This open space allows for easily accessible access to all IT equipment. Racks are to be positioned as required by DIA IT department to utilize non-standard racks for specific applications. The IT server room floor covering is data center rated carpet tile.



**3,348 SF of Contiguous Data Center Space**

## B. LEED Compliance

The Data Center shall achieve and be certified for LEED® Silver Certification with the goal of achieving LEED® Gold Certification, through the Green Building Certification Institute (GBCI), U.S. Green Building Council (USGBC), under the LEED® 2009 Rating System or the most current at time of Project registration. Our initial design & plan assessment for LEED confirms the capability to achieve Silver certification (50-59 points required) is confidently achievable and efforts are planned to strive for LEED Gold (60-79 points required).

## **C. Modular Structure and Interiors**

**Colorado Resolution 35:** The Modular structures shall comply with and be certified by the State of Colorado under the provisions of Colorado State Resolution 35.

**MDC Construction:** Skids shall be constructed of welded W12 x 45lb/ft structural steel I-Beam. Skid shall consist of I-Beam perimeter and strategically located cross members. Floor supports shall be formed of 7 gauge HRPO (Hot Rolled Pickled and Oiled) Steel. 1/4" Supports located at strategic component support locations. Rigging mechanism shall consist of either four (4) or eight (8) (depending on overall unit weight) drag hats placed along the long sides of each module. Hats shall be mounted to skid via twelve (12) 5/8" - 11 bolts. Hats shall be made of 1/2" grade 50 steel. The modular plant construction shall consist of a completely welded structural frame and removable panels. Structural members shall be made of welded tube frame with formed 10 gauge corner gussets. Side supports (bolted) shall be located in place for wall mounting and shall be easily removable for future expansion from single to multiple modules. Side supports (welded) shall be designed to remain in place for roof structural support. Modular data center structure shall be designed to withstand a minimum of 160 mph wind gusts. Installing contractor shall be responsible for modular skid vibration isolation onsite.

**MDC Casing:** Modular data center exterior casing shall be specifically designed for use in an outdoor application. All panels shall be sealed prior to shipment and shall be removable for service access. Panels shall be bolted and screwed into place with weather stripping to prevent weather access. Modular data center shall be supplied with double wall panel walls and roof with 3" Thermafiber® insulation. Exterior walls shall be constructed of 1/8" aluminum, powder coated. Exterior casing screws shall be zinc chromate coated & painted to match external wall color. The modular roof shall be constructed of 10 gauge HRPO sheet steel. Interior walls and roof shall be constructed of 0.050" thick perforated aluminum lining. Interior walls shall be insulated with 3" wall insulation that is specifically designed for a minimum 5 Hr fire rated protection, sound attenuation that shall conform to NFPA 90 and shall have a minimum thermal insulation rating of R-13.

**MDC Roof:** Roof construction shall be designed to accommodate a minimum snow-load of 30 lb/ft<sup>2</sup>. Each individual module shall be designed for individual rain management. Each module roof shall be constructed of continuously welded seams along the length & side seams to eliminate water infiltration. Roof shall be pitched a minimum of 1/4" per foot to both module ends for easy rain runoff. Side rails shall consist of a minimum 1/4" wall 10 x 4 structural rectangular tubing structural steel. End rails shall consist of minimum 1/4" wall 2 x 2 and 10 x 4 structural rectangular tubing structural steel. Roof supports and surface shall consist of formed a minimum of 10 gauge HRPO steel.

**MDC Plant Egress and Service Access:** Pedestrian Egress Doors: A fire extinguisher and Placard shall be provided at each egress. Fire extinguisher shall be comprised of a 10 lb dry chemical; Classes A-B-C. A single man access door assembly with emergency panic bar shall be provided for emergency exit / egress. Egress door shall be of the same material type as exterior/interior casing. Egress door latches shall utilize a latching mechanism to insure maximum sealing. Double Door Service Access: Lockable double doors shall be located as shown on the drawing for service and maintenance access. The primary door assembly shall be provided with emergency panic bar for emergency exit. The mating door shall include lockable latches at top and bottom of the door. The access doors shall be provided with a single door handle linked to multiple latching points.

**MDC Finishes:** Modular plants shall be painted prior to shipment. All painted surfaces must adhere to finish manufacturer recommendations for preparation and applying finishes. Exterior finish coat shall be Desert Sand, Champagne #2 (std), or other owner approved color. Skid & Roof Canopy. Zinc Rich Primer (Base Coat) – A base coat consisting of an organic zinc rich layer that is a ready-for-use, self-curing, and cathodically protective maintenance coated material shall be utilized as the base coat. Zinc Rich base coat shall be applied only after the associated component steel has been properly prepared and blasted. Base coat shall also be used as a touch-up primer for selected galvanized steel or zinc rich coatings. Base coat shall be able to adhere to minimum 5,000 Hours Salt Spray excellent resistivity per



ASTM B-117. Primer (Second Coat) – A second protective coat shall be chrome-free, high build epoxy primer that is designed for maximum filling and corrosion resistance when applied over properly prepared steel and aluminum. Primer shall be suited for application over sandblasted metals and where superior film build and corrosion resistance are required. Primer shall be easy to mix, provide excellent build and leveling, and offer rapid dry to recoat times. Second coat primer shall have a minimum of 500 Hours Salt Spray excellent resistivity per ASTM B-117. Topcoat – The topcoat finish shall be polyurethane enamel for interior and exterior use on properly prepared and or primed metal surfaces. Polyurethane enamel shall provide excellent flow and leveling, film hardness and good exterior durability. Polyurethane enamel shall provide a minimum of 500 Hours Salt Spray excellent resistivity per ASTM B-117.

Casing & External Panels shall be finished with a standard powder coating applied to the unit. Finished unit meet shall meet a minimum 1000-hour salt spray solution without any sign of red rust when tested in accordance with ASTM B-117. Zinc Rich Primer (Base Coat) – A zinc rich primer powder coating that is aesthetically pleasing shall be included within the base coat to produce a durable uniform finish. Finish shall be an epoxy powder coating to provide a combination of good physical and chemical resistance properties. Base coat shall be an excellent corrosion resistance and good chemical resistance and VOCs that are essentially zero. Coating shall be manufactured to ISO and QS standards. Powder Coating (Top Coat) – Top coat shall be recommended for a broad range of interior / exterior functional and decorative applications. Substrate shall be free of grease, oil, dirt, fingerprints, drawing compounds, any contamination, and surface preparation treatments to ensure optimum adhesion and coating performance properties. For aluminum components, a minimum of a 5-stage chrome phosphate metal treatment, or equivalent, is required for good adhesion and optimum coating performance properties. Powder coated top coat shall adhere to a minimum of 1000 hours in reference of excellent rating in accordance with ASTM B-117.

**MDC Enclosure Construction**

- Exterior walls panels made of 1/8" aluminum with a Powder Coat Finish.
- Interior walls made of .050" thick perforated aluminum (33% open).
- Roof sheets are 10ga (.134" thick) mild steel.
- Roof canopy is of welded construction and painted with a 2 coat, C5 Wet Paint
- System (Interzinc 52 two component zinc rich epoxy primer with Intercure 99 two component Polyaspartic paint top coat).
- Rafters are made of 10ga (.134" thick) mild steel and placed on 24" centers.
- 1/16" x 1/2" 3M tape is applied on the sealing surface of all exterior wall panels for weather resistance.
- Doors panels are 18ga (.048" thick) electro-statically painted galvanized steel.
- Door frames are 16ga (.060" thick) electro-statically painted galvanized steel. See attached spec for standard hardware.
- Walls are insulated with 3" thick, 4 lb per sq foot mineral wool for insulation and sound attenuation.
- Exterior wall panels are fastened to structure using 1/4 - 14 x 1" long self-drilling, self-sealing screws that are spaced approximately every 8" on center.

**MDC Skid Base Construction**

- Perimeter of skid is constructed of MC8x22.8 structural c-channel.
- Floor supports are 7ga (.179" thick) formed c-channels on 30" centers, locations that support heavy equipment (pumps, MCCs, etc...) are made of 1/4" thick formed c-channels.
- Floor decking is made of 3/16" thick steel diamond plate. Diamond plate is welded to skid frame prior to painting.
- Floor drains are piped to the perimeter of the skid using 2" schedule 40 pipe.
- Lifting bars are 1-1/2" cold rolled round bar stock (ASTMA36) welded between the flanges of the perimeter MC channel.
- Skid base is painted to match the enclosure with a 2 coat, C5 Wet Paint System

(Interzinc 52 two component zinc rich epoxy primer with Intercure 99 two component Polyaspartic paint top coat).

**ASTM Material Specifications**

- LIFTING BARS – ASTM A36
- FORMED HRPO – ASTM A36
- STRUCTURAL BEAM – ASTM A992
- STRUCTURAL CHANNEL – ASTM A992
- STRUCTURAL TUBE – ASTM A500 GRADE B
- GALVANNEAL SHEETS – ASTM 653

**Doors****Material Specifications**

- DOOR PANEL: 18GA GALVANNEALED STEEL
- DOOR FRAME: 16GA GALVANNEALED STEEL

**Fire Rating**

- EXTERIOR DOORS – 2 HR
- INTERIOR DOORS TO DATA MODULES – 2 HR

**Handing**

- DOOR TO BE LHR #3

**Finish**

- DOOR AND FRAME TO BE PRIMED AND PAINTED: COLOR: TBD

**Hardware Specifications**

- HINGES: QTY 3 HAGER EC1100 USP (STD)
- EXIT DEVICE: QTY 1 DIA STANDARD HARDWARE
- THUMBLATCH: QTY 1 DIA STANDARD HARDWARE
- RIM CYLINDER: QTY 1 DIA STANDARD HARDWARE
- ACCESS CONTROL CARD READERS SHALL CONFORM TO DIA STANDARDS
- WEATHERSTRIP: QTY 1-36 2-80 LORIENT ES700/IS1045 (STD)
- WEATHERSTRIP: QTY 1-36 2-80 HAGER 8735-N-MIL (STD) FACTORY INSTALLED ON HINGE SIDE
- DOOR CLOSER: QTY 1 HAGER 5300-MLT-26-ALM-HO (ORO)
- DRIP CAP: QTY 1 WELDED IN STEEL CHANNEL IN TOP OF DOOR PANEL (MFR)
- DOOR SWEEP: QTY 3 FT HAGER 770 S-V-MIL (STD)
- INSULATION: QTY 1 R9 RIGID FOAM (STD)
  - VIEW LITE: QTY 1 10 X 10 VIEWABLE ELECTRO GALVANIZED STEEL FRAME WIRE REINFORCED ANEMOSTAT LOPRO-C-W-EG 12 X 12 (ORO)
  - THRESHOLD: QTY 1 HAGER 433S-MIL (ORO) INCLUDES BRACKETS WELDED TO UNDERSIDE ON EACH SIDE FOR ATTACHING TO FRAME WITH SCREWS

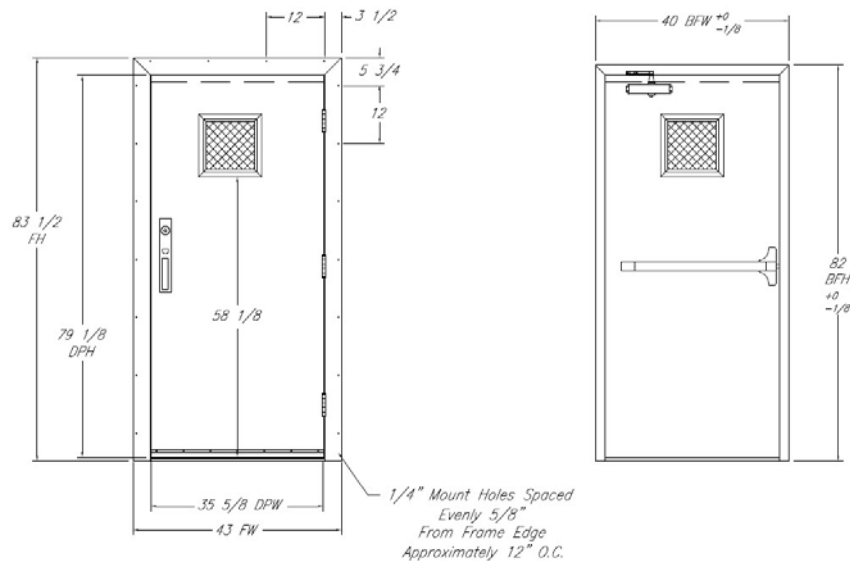
**Hardware Installation**

- FACTORY INSTALLATION OF ALL HARDWARE
- ALL DOORS SHALL BE KEYED TO DIA STANDARDS



**Door Crating Specifications**

- DOORS TO BE STOOD UPRIGHT ON SKID
- DOORS TO BE SKIDDED AND STRETCH WRAPPED



**Rollup Overhead Door at Loading/Receiving Dock**

We have included an automatic electrically operated overhead rollup door for the loading / receiving dock area. We have also relocated the drive so that delivery vehicles can back into the dock area. Door manufacturer material will be different from the module material. Overhead door can be painted to match modules if desired. Overhead door shall be hurricane rated.

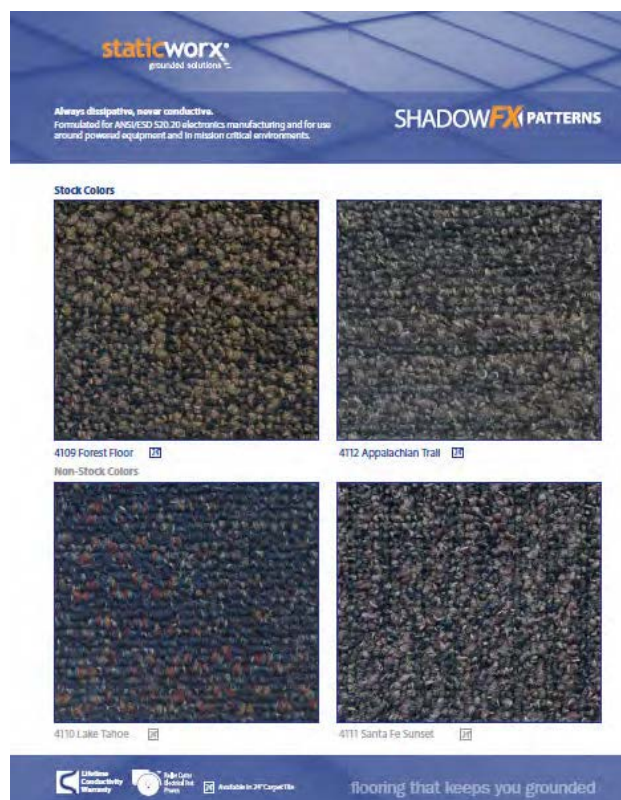


Exterior View



Interior View

### Carpet (Server Room and Ancillary Areas)



- Conductive Fiber - Staticworx helix 44 denier conductive Fiber
- kV Rating - atcc 134-1996 electrostatic propensity: less than .4 kv (400 volts). tested at 12% relative humidity at 20oc and 70oF.
- Body Voltage Generation - Voltage on person in combination with grounded carpet tile < 50 volts.
- (BVG) Per ANSI/ESD S97.2 - Meets aNsi/Esd s20.20-2007 requirements for use in EPas in electronics manufacturing.
- ESD S7.1/NFPA 99 Resistance - Nine or more readings from surface to groundable point. tested with an applied
- Characterization of Materials - Voltage of 100v. measured in ohms, 1.0 x 10<sup>6</sup> – 1.0 x 10<sup>8</sup>.
- ESD S7.1/NFPA 99 Resistive - Nine or more readings between electrodes placed 1 foot apart. tested with an applied
- Characterization of Materials - Voltage of 100v. measured in ohms, 1.0 x 10<sup>6</sup> – 1.0 x 10<sup>8</sup>. meets motorola R56 and atls-0600321 for use in telecommunications applications. meets Faa std 019e for use in flight control applications.
- Electrical Resistance/Voltage - Approved for use in EPas in electronics manufacturing with approved footwear system.
- Test ANSI/ESD S-20.20 - Results within recommended range < 35 x 10<sup>6</sup> ohm or < 100 volts.
- D.O.D. HDBK263A - Meets recommended guidelines for sensitive Esd devices, class 1.
- Section 40.1.2
- Roller Caster Electrical - Product meets aNsi/Esd s20.20 after 125,000 cycles.
- Test (CET)
- Groundable Path - Copper ground strip.
- Grounding Frequency - 1 per 1,000 sq. ft.

- Backing Systems - Permanent static-dissipative backing.
- Adhesives - Use only staticworx-approved conductive adhesives. Groundtack pressure sensitive. Groundwise corner pads for adhesive-free installations over raised access floors.

For additional specifications, visit [www.staticworx.com](http://www.staticworx.com).

### LED Lighting System

Our proposal includes providing energy efficient LED lighting system in the modular data center. LED lighting offers advantages such as low energy usage and long lamp life (60,000 hours). This will contribute to the overall low PUE for the data center while providing excellent light levels. The following is a sample industrial grade LED lamp and fixture. We have selected a Lithonia 60 W, 4000 lumen lamp with 3,500 K temperature lamp.



**Features and Specifications** - An attractive and energy-efficient surface-mounted or suspended LED luminaire suitable for wet, damp and/or cold locations. For challenging situations where relatively low fixture mounting heights and wide fixture spacings are common — such as industrial facilities, parking garages, retail malls, multi-purpose rooms, garden centers, and airports.

**Construction** - One-piece 5VA fiberglass housing with integral perimeter channel utilizing continuous poured-in-place closed cell gasket.

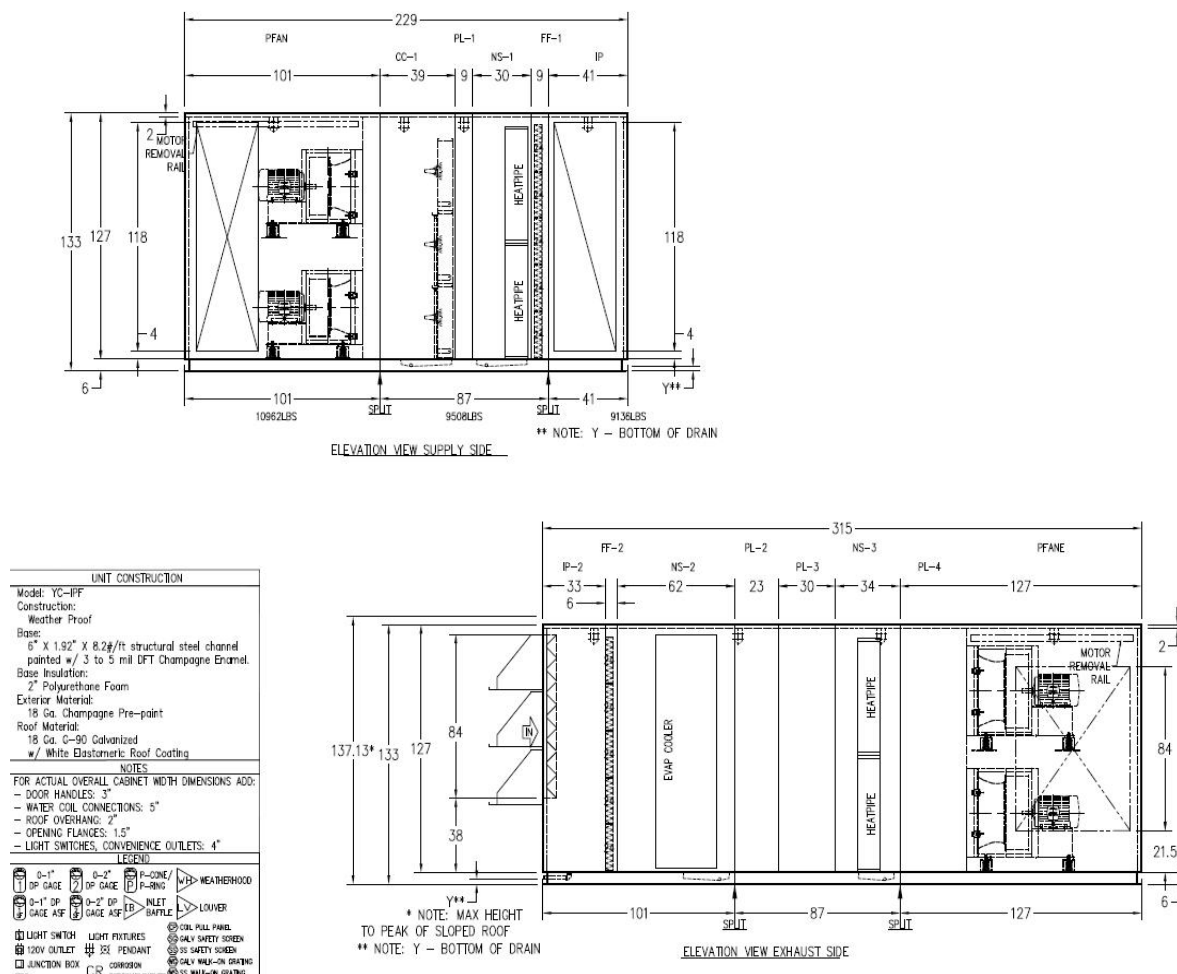
FEM4LED		4L		/		IMAFL		
Series		Lumens/Color temperature¹		Distribution		Diffuser		Voltage
FEM4 LED	4'	Nominal Lumens		Color temperature		(blank)	General distribution	IMAFL Acrylic, lineal ribbed frosted lens (blank)
FEM8 LED	8'	3L	3000 lumens	(blank)	4100K (CRI 65)	SD	Spread distribution	IMACD Acrylic, clear deep lens 120
		4L	4000 lumens	27	2700K (CRI 80)			IMAFL Acrylic, clear deep frosted lens 277
		6L	6000 lumens	35	3500K (CRI 80)			
		9L	9000 lumens	57	5700K (CRI 70)			
				AMB	Amber LED			

### D. Cooling

## Data Center Cooling and Air Distribution System

## IT Server Space

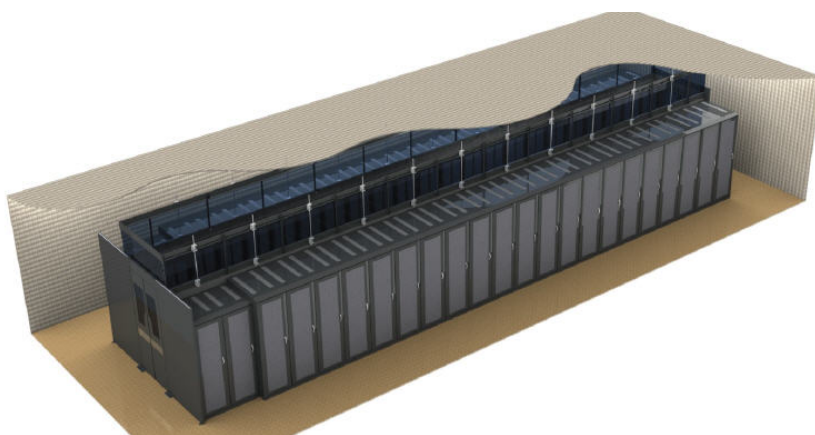
The cooling system consists of four (4) variable speed fan Air Handling Units with heat pipes and evaporative cooling as the primary means of cooling the IT server room space.



**How it Works** - To provide cooling to the data equipment four (4) air handling units will be provided with capacities such that three (3) units will be able to carry the entire cooling load. Each air handling unit will consist of two separate air tunnels. The first tunnel will provide cooling to the data center equipment. This tunnel will consist of a filter section, a heat pipe, a supplemental/back-up direct expansion (DX) cooling coil and the supply fans. Air flowing through the first tunnel will consist of 100% return air from the data center. It is not anticipated that there will be any outside air introduced unless required for space pressurization. The second tunnel will handle 100% outside air and will serve as a means to transfer the heat from the data equipment to the outside air. This tunnel will consist of filters, an evaporative cooler, heat pipe coil and exhaust fans. Both air tunnels will have dual fans which are controlled by variable speed drives. The variable speed drives will be used to help with balancing of the supply airflow to the data center through the first tunnel. The variable speed drive on the fans in second air tunnel will be used to change the amount of airflow across the heat pipe to control the rate of transfer of heat through the heat pipe.

Depending upon the outside air conditions, we are able to remove up to 100% of the heat generated by the data equipment through the heat pipe. On days with cold to cool outside air all of the heat will be removed by the heat pipe by simply flowing air across both of its coils. Note that the heat pipe becomes more efficient with colder weather so the exhaust fans will be slowed down to control the supply air temperature to the data center which will further reduce the energy consumption of the air handling units. On more temperate days, the evaporative cooler will be run to pre-cool the outside air before flowing through the heat pipe to provide cooling. DX cooling is also available and anticipated to only operate on very warm days to days to provide supplemental cooling should the heat pipe and evaporative cooler not be able to meet 100% of the cooling load. Note that the DX system will be sized to handle 100% of the cooling load should the water supply for the evaporative cooler be lost and the outside air temperature be warm enough that the heat pipe cannot provide any supplemental cooling.

**Hot Aisle Containment** - The design of the IT Space incorporates a Hot Aisle containment arrangement. The AHUS shall provide cool air ducted to the IT space to the inlets of the racks. A hot aisle containment system shall capture the heated air from the outlet of the racks and it will be ducted into a common return air duct back to the AHU's.



**Hot Aisle Containment**

**Energy Efficient System** - The heat pipes combined with indirect evaporative cooling will provide a very energy efficient system. This system enables a low data center PUE performance.

**Rack Space Environmental Monitoring** - Four high, mid, low height rack temperatures and one rack humidity sensor per rack row is provided in the IT data space to monitor for hot and dry spots. This data is used for critical alarming and trending of IT space environmental conditions through the building



automation system. Four high, mid, low height rack temperatures and one rack humidity sensor per rack row is provided in the IT data space to monitor for hot and dry spots.

**Tier III Compliance-** The cooling system is designed such that three of the four AHU's will maintain the cooling load at design conditions. N+1 redundancy is provided by having a fourth AHU system. Based on the most energy efficient control strategy, all four AHU's will operate normally at reduced fan speed through the variable speed drives. If one of the AHU systems were to fail, the remaining three AHU's would ramp up and satisfy the cooling load requirement. The system is designed with redundant A-B power sources with automatic switchover in the case of loss of power. An AHU manager control system consists of redundant controllers to provide backup in case of AHU controller failure and is on UPS power. The direct expansion cooling coils which have been sized to handle the full load of the data center will provide cooling in case of loss of water to the evaporative cooling system.

**Humidification** - An ultrasonic humidification system will be installed in the service area and ducted into the IT space. The system consists of two humidifier units and one controller. All water connections shall be made outside of the IT space. The ultrasonic humidifier is the cleanest and most energy efficient humidifier available. Compared to electrode boiler or infrared humidifiers, the ultrasonic humidifier requires 93 % less electrical energy to operate. This will contribute to a low PUE for the data center. The Ultrasonic humidifiers produce a very fine mist of approximately 0.001 mm (1 micron) average diameter, which is quickly absorbed into the air. The ultrasonic system is used in data centers because of its cleanliness and energy efficiency. The controller will be furnished with a Bacnet communications card which will integrate into the building automation system monitoring, control, and alarm monitoring.



***Ultrasonic Humidification - Located in Service Module and ducted into the IT/ Server Space***

### **Ancillary and Support Areas**

Service Area heating and cooling shall consist of a DX fan coil unit for cooling, an electric heating coil for temporary heating and a mixing box connected to the hot aisle exhaust air duct for introduction of heated air into the service module space for use during the heating season. This heat recovery system provides for a low PUE for the data center. Diffusers shall be connected from the fan coil unit sized for air distribution to each of the various spaces. A DDC controller shall operate the fan coil unit through a wall mounted space temperature sensor.

Power Modules shall have a ceiling hung cooling only fan coil unit controlled through a DDC controller and a wall mounted space temperature sensor.

### **Temporary Heating**

Two Ceiling hung electric heating unit heaters shall be installed in the IT serve area and the ancillary area. The ancillary area shall be heated from an electric heating coil in the fan coil unit serving this area.

**E. Electrical****Data Center Electrical Power Infrastructure Overview**

The proposed power infrastructure is a 2N Tier III design that is concurrently maintainable. The base construction provides 750Kw for the critical IT load and is designed to upgrade to double the UPS capacity (2X rack power density enabling a total 1.5Mw of critical IT power) while the data center is operational; this upgrade will include the addition of appropriate service cables sized for code compliance, upgrading of breakers and breaker trips, adding a UPS, and adding a genset.

The redundant “A” and “B” power systems reside in separate modules and are independent.

The power system consists of two utility feeds connected at the street. These two utility feeds from 2500KVA utility transformers (provided by others) are connected independently to Input Switchboard A and Input Switchboard B through duct banks having 7 x 500MCM/0 cables in conduit for to support the initial 750Kw IT load and conduit or conduits as required for the future addition of cables to accommodate a future 1.5KW IT load. Input Switchboard A and B are also fed by Paralleling Switchgear that is connected to two backup 750Kw gensets. Parallel Switchgear sensing and logic controls detect utility failures and start both gensets when needed and feed the power to A or to B. The Paralleling switchgear is in the same line-up with Input Switchboard A that is connected to the utility power source and is co-located with other A side electrical equipment in Power Module A.

Input Switchboard A, B and paralleling switchgear design coordination, including automatic transfer/trip-over with sequences of operation programming, assure that the switchboard A and B buses are not energized by the utility source simultaneously with energy sourced from the gensets. Paralleling controller will monitor utility input power via utility sensor on Input Switchboard A/B utility input lines. When utility failure is detected, paralleling controller will take action to disconnect the utility feed from Input Switchboard A/B bus while starting/synching the prime rated gensets and when their 480V AC supply is confirmed, will confirm the Input Switchboard A and B bus is powerless and then apply genset power source to Switchboard A/B bus. This is expected to be accomplished by the paralleling controller sensing utility source signals input to the Input Switchgear A/B breaker and actuating the motorized, controlled and monitored Utility input breaker in Switchboard A and B so that when utility power fails, this breaker will be opened while the paralleling gear starts the standby gensets; once standby gensets are synchronized and producing proper AC service, the paralleling controller will confirm via monitoring sensor that Input Switchboard A/B are de-energized and will then actuate the Paralleling breaker to apply genset power source to Input Switchboard A/B bus. Genset power feed to Input Switchgear A/B will be accomplished through duct banks having 7 x 500CM/0 cables in conduit for to support the initial 750Kw IT load and conduit for the future addition of cables to accommodate a future 1.5KW IT load.

The paralleling switchgear integrated with the Gensets and Input Switchboards A and B are designed through proven experience to start the gensets and provide reliable power in less than 15 seconds upon losing utility power. The design and technology applied is similar to the practice used for the hospital industry requiring and with demonstrated performance to comply

with hospital industry and regulatory requirement to engage emergency generator power in less than 10-12 seconds. 6 minutes of battery backup is provided in the design.

Input Switchboard A and B feed power to the A and B Eaton 825kva 9395 UPS's. These UPS's have high efficiency capability and by-pass systems included. These USP's provide the 750Kw power for the critical IT load and to HVAC controls, security system and the fire system through an electrical distribution system. Input Switchboard A/B are UL891 construction with draw-out breakers.

Input Switchboard A and B also feed "Mechanical" A and B Switchboards through which power is distributed to mechanical equipment (air handler units/modules) and to non-IT loads in the Technical Service Module. Mechanical Switchboards A/B are UL891 with fixed-mount breakers.

Battery supported Eaton double conversion 9395 UPS A and B outputs 480V to the UPS Output Switchboard A and B. UPS Output Switchboard A and B include breakers for protecting the UPS and the 480/208 transformer. UPS Output Switchboard A and B are UL891 construction with fixed-mount breakers and are provisioned for the future addition of a breaker for supplying a feed for an optional 400/230V distribution system.

A 900KVA 480/208 transformer with copper windings sized to provide power for the initial 750Kw IT load is included for feeding power to a 208V Distribution Panel. UPS Output Switchboard A and B are provisioned for upgrading breakers to supply power for a future upgrade to a 1750KVA transformer for a future 1.5Mw IT load capability.

The 480/208 transformer on the A and B side feed Distribution Panel A and B that are UL891 construction having fixed-mount breakers. This Distribution panel includes breakers that feed redundant A and B Starline busways for six (6) rack rows in IT modules 1, 2 and 3. Breakers feeding the Starline busways are sized for supplying the initial 750KW IT load where the distribution panel is also provisioned for a future upgrade of the breakers to supply power to the same Starline busways for a future 1.5MW IT load.

The redundant Starline copper bus-ways included in the base construction are rated for 800A at 600V. The 600V rating can also accommodate a 400/230V distribution option. A redundant A and B Starline busway is provided for each of the included six (6) rack rows. Starline dual corded plug-ins are provided to feed two adjacent racks from a single breaker protected plug-in connecting Raritan e-pdu's to the Starline bus-way.

The included Starline power distribution plug-in's include connectors matched to the client specified Raritan epdu's (see the expanded Starline system description). Plug-in connectivity is provided to feed the racks from A and B bus-way's. Each rack includes and A and a B Raritan epdu of the type specified by the client (see the Raritan epdu description).

A branch circuit plug-in is provided to feed a single phase 120V control panel from a Starline A and B bus-way providing redundant UPS power for hvac controls, the security system and the fire control system. A single branch circuit plug-in feeds power to the equipment staging rack in the tech service module.



Mechanical Switchboards A and B feed power to the N+1 air handling unit (AHU's) cooling system and to non-IT data center facility loads, mostly in the technical service module space (lights, water heater, utilitarian plug-loads, non-IT space heating and cooling, etc). Each AHU includes an ATS connected to the A and B feeds from the Mechanical switchboards enabling the concurrently maintainable N+1 Tier 3 solution.

Paralleling switchgear, switchboards and distribution panels utilize Eaton breakers and have copper buses/bussing/bus-ways. Input switchboard A and B are draw out breakers while all other equipment utilizes fixed mount breakers. Fixed mount breakers have panel backs flush to the wall, optimizing space. The 2N A and B sides enable concurrent maintainability as well as redundancy.

The base construction distribution chassis, cabling, connections, bus's, and breaker frames are sized to support a future 1.5Kw IT load. All conductors will be copper and will be sized to meet code requirements, including NEC. Initial sizing of service conductors, breakers and the 900KVA 480/208 transformers are sized to support an initial 750Kw IT load. Paralleling switchgear, switchboards, and distribution panels are provisioned for future breaker upgrades for a future 1.5Mw IT load. A future upgrade to 1.5Mw IT load capacity requires upgrade of service cables, switchgear, switchboard and distribution breakers, the addition of a paralleling switchgear section for a third 750KW genset, the addition of a third 750KW genset, the addition of a battery (6min) supported Eaton 750KW UPS, the change out of the 900KVA 480/230V transformer by a 1750KVA transformer (copper windings), and the addition of breakers to the Mechanical switchboards for additional AHUs.

For both the initial 750Kw IT load construction and future expansion to 1.5Mw IT load capacity, the electrical Power Modules will be sized and internal spacing and construction will be NEC and local code compliant, and will meet serviceability requirements stated by the equipment providers (e.g. Eaton).

The included one-line diagram explains the base construction design. All electrical modules, under this phase of construction, will be adequately designed and sized to accommodate the electrical equipment with the required safety clearances and maintenance access. All conductors shall be copper. The single line diagram shall be updated with wire sizes with which the ampacity shall meet or exceed the size of the breaker being served per the NEC.

**Eaton Double Conversion UPS**

The UPS included in the base construction is the Eaton 9395-825KVA having superior efficiency characteristics:

- 825KVA, 743KW, 0.9Pf
- UPS input - 480V, 60Hz;
- UPS output 480V, 60 Hz
- Double conversion UPS in-line technology
- Energy Savings System (ESS) for 99% efficiency
- Inherent Redundancy option included – when at or below 50% capacity, UPM's automatically share load enabling high efficiency across a broad load range
- Concurrently maintainable UPM (uninterruptable power modules)
- Industry leading 95% + efficiency with wide efficiency load range
- LEED certification credit enabler including SMarT (Sustainable Materials Rating Technology) Gold certification for

Some key performance characteristics:

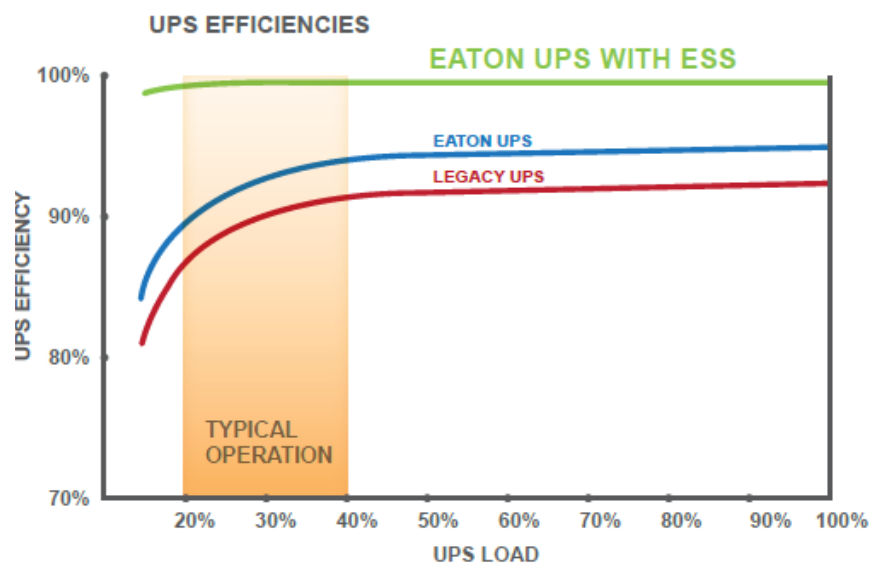
- Double conversion completely isolates output from all input noise and anomalies providing completely clean power to the IT load
- Efficiency manages leading pf loads down to 0.9pf without derating
- THD within 2% of nominal specs for linear loads; within 5% for non-linear
- Powerware Hot Sync technology – enables synchronization, load sharing and selectively dynamic trip capability including: non system level single point of failure; upm's are paralleled, operating completely independently
- Syn Control – ensures outputs of multiple separate UPS's operate in phase with one another enabling their respective interacting/interconnected static transfer switches to change states seamlessly
- Monitoring and alarming for UPS, inputs, outputs, bypass, and battery system performance and status is enabled and information integrated to BAS and DCIM
- SAT system provides the smarts and technology to autonomously provide reliable power for the redundant A and B power system in the event the A or B distribution system fails, the UPS systems automatically transfers the entire UPS load to the alternate A or B system
- System By-pass modules - enables service, uptime backup and maintainability
- Concurrent maintenance is enhanced by UPMs since they operate in parallel and the UPM construction provides high serviceability single front-side physical maintenance access

### Eaton 825KVA UPS

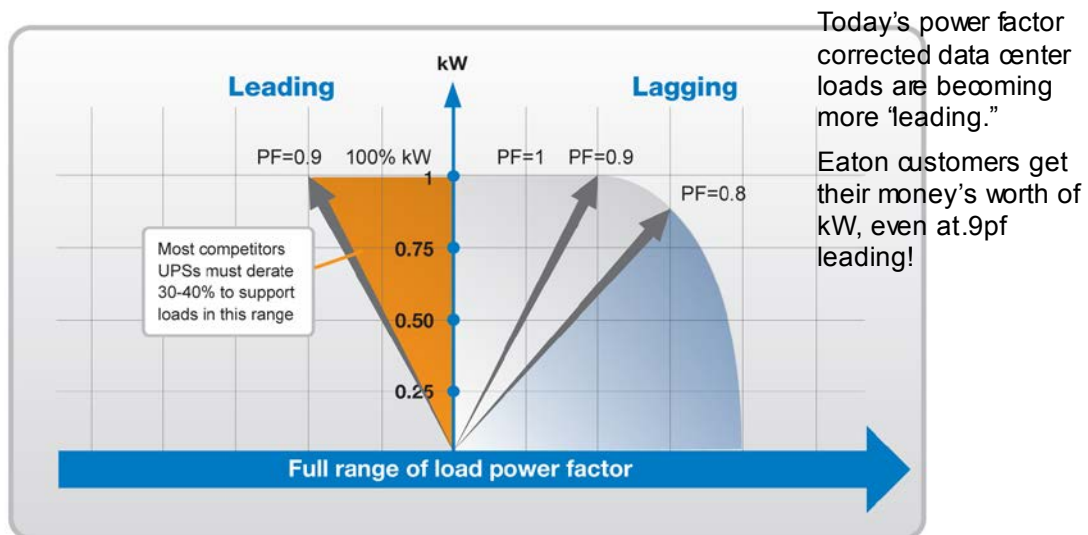


9395 825 kVA

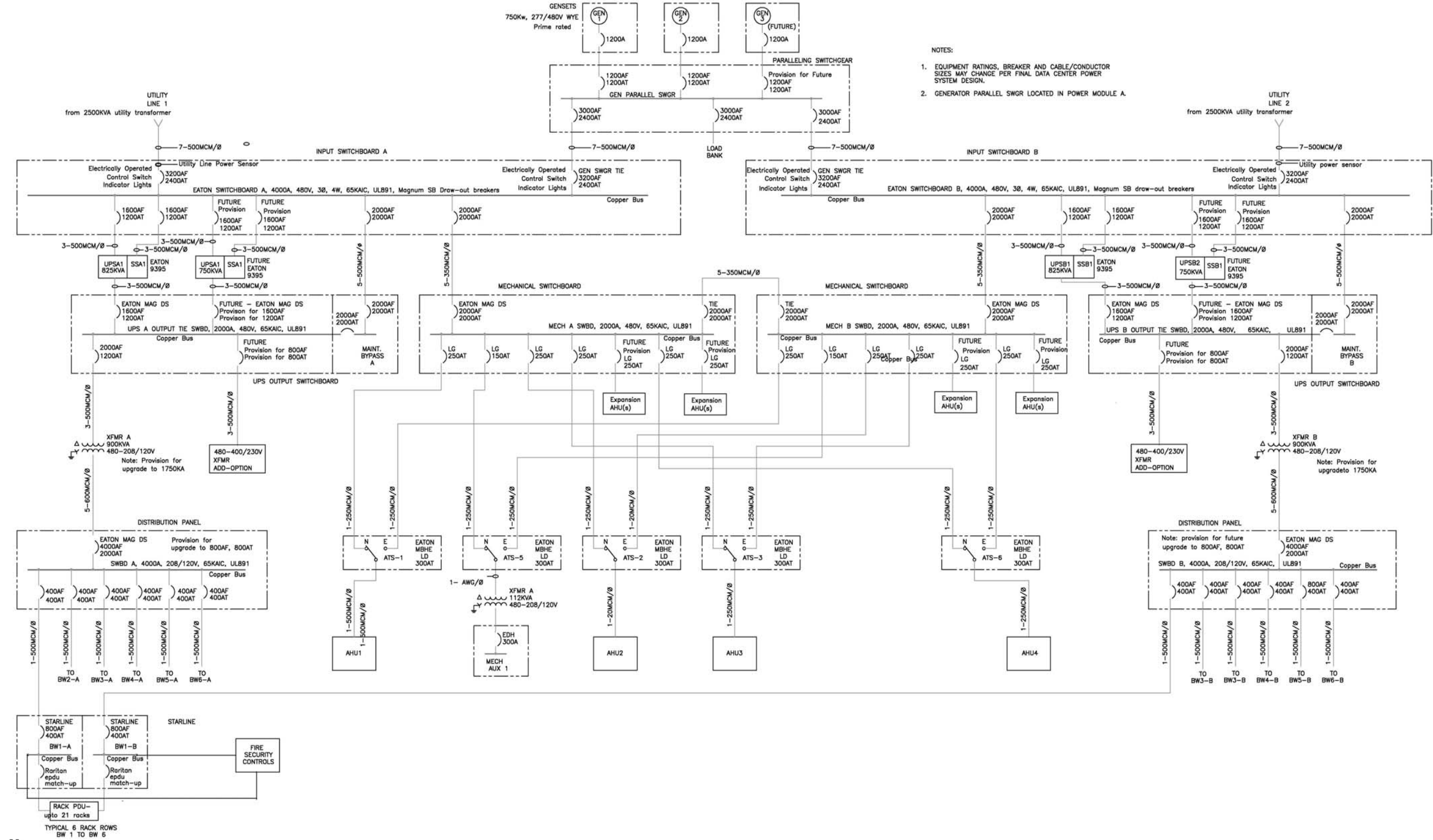
### Eaton UPS Efficiency vs. Load



Eaton Power-Factor Tolerance Performance:



The system shall be furnished with equipment as shown in the one line electrical diagram on the next page.



The single line diagram on the previous page is for a general understanding of the electrical system. The Design-Build Contractor is responsible to ensure final electrical design meets these requirements.

## **Rack Power Delivery**

### **Starline Electrical Track Busway System**

A Starline B800 power bus-way and associated components are included:

- Included is a B800 (T5 system) copper bus-way:
  - supporting up to 600V, 800A;
  - continuous access with shutters;
  - interchangeable with Starline B250 or B400 and select other plug-ins;
  - end-of-row power feeds;
  - 10ft bus-way runs connected by couplers to provide an A and a B (redundant) 40ft rack-row run for 6 rack rows
- Included are dual plug-ins where a single plug-in contains dual breakers and cable assemblies for feeding two racks and having Raritan compatible connectors to enable:
  - Qty (8) for 18Kw/rack, Raritan PX-5551
  - Qty (22) for 12Kw/rack, Raritan PX-5535
  - Qty (12) for 6Kw/rack, Raritan PX-5660
- Included is a breaker plug-in feed for low Kva, 120V controls panel (HVAC, Fire, Security controls).
- Included is a breaker plug-in for a non-redundant feed for 208V 3ph for the lab/provisioning rack in the Tech Service module.
- Included Starline components:
  - 800A bus-way - B800T5CCS-4PG
  - 800A bus-way assembly parts - EF800T5-4, -4R, EC800T5 & JK800T5-1
  - Plug-ins:
    - PX-5660 - CBMDCT5E28-X-(2)L2130C-4
    - PX-5535 - CBMDCT5E28-X-(2)CS8365C-4
    - PX-5660 - CBMDCT5E28-X-(2)460P9W-4

The following are illustrations of the Starline B800 bus-way and components:

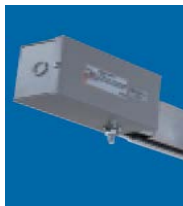


Easy, continuous access to power is enabled by the bus-way using a variety of plug-ins:

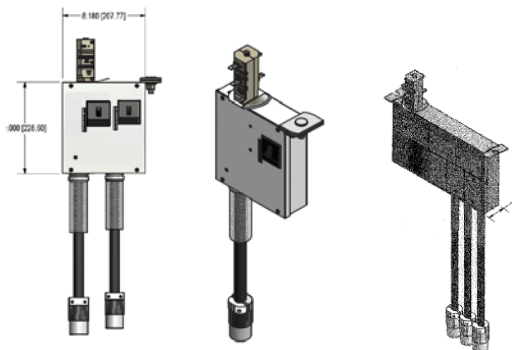




End-of-run power feed    Breaker power access (for UPS controls circuit)



Dual/multi-breaker-corded plug-in's enable cost effective feeds to multiple racks.



Redundant feeds from and A and B path will provide Tier III power distribution:

The following is the rack-space redundant (A&B) Starline bus layout that also accommodates mixed density racks and the Eaton security cage.

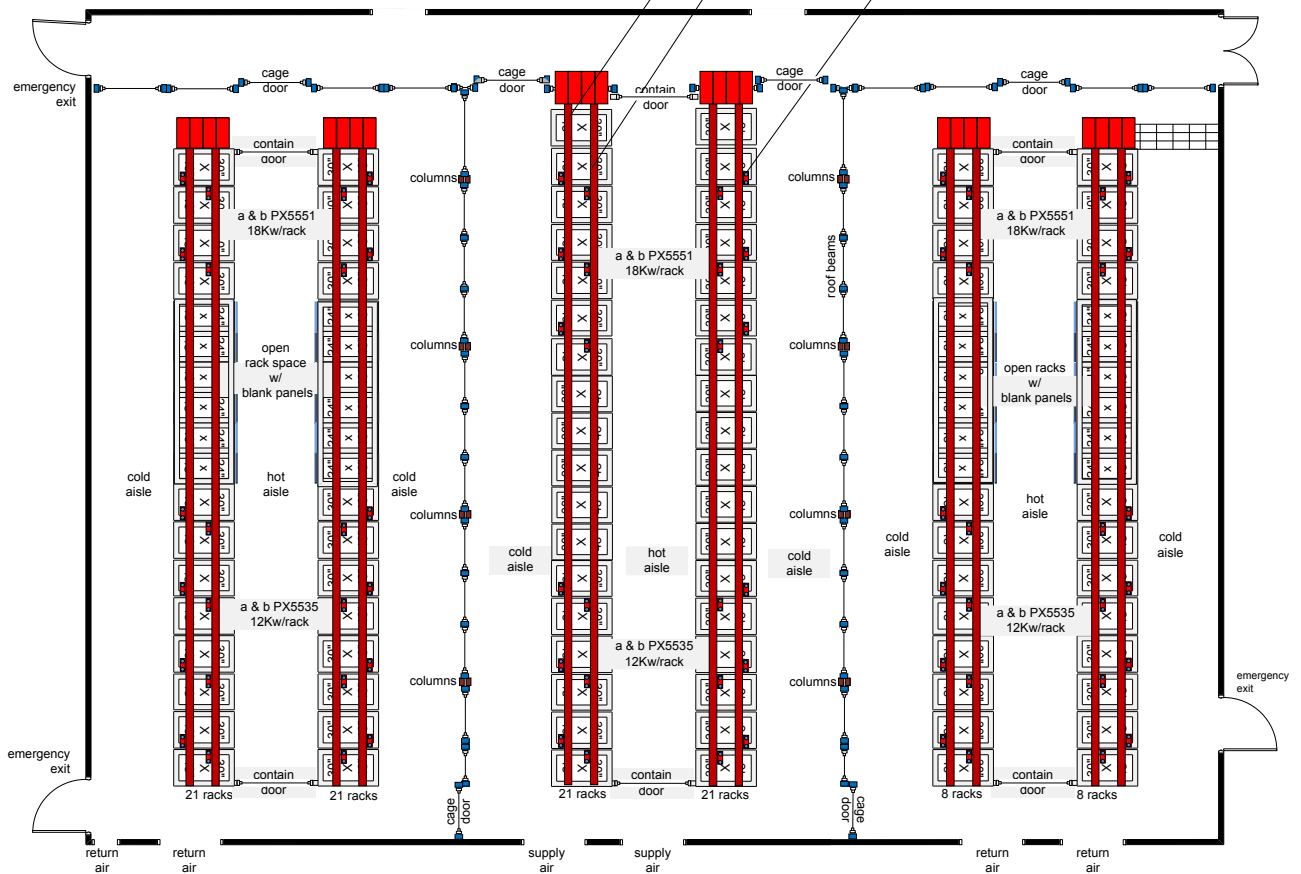
### Rackspace Power Distribution – Starline Bus-way

*basket cable trays for A and B bus-way for each rack row;  
with one dual breaker/corded plug-in per rack pair on A & B.*

*Power feed for Starline Power Busway.*

*800A 208V Starline Power Busway.*

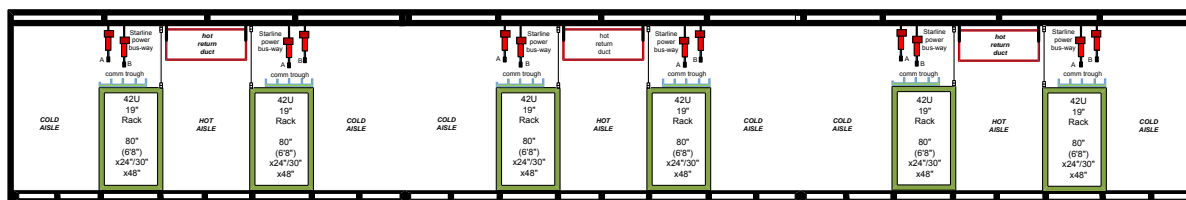
*Dual Corded bus-way plug-in's*



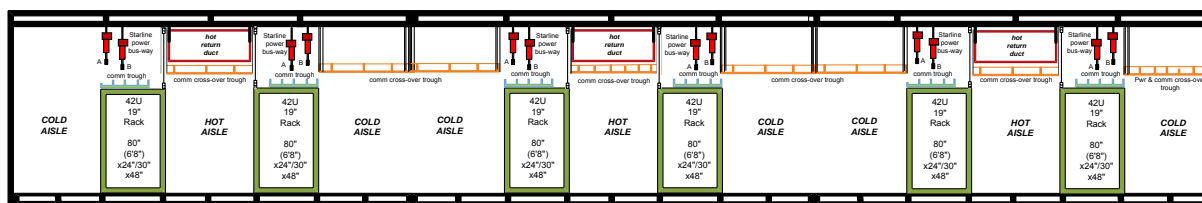


The following is the Rack-space cross-section with Starline bus-way:

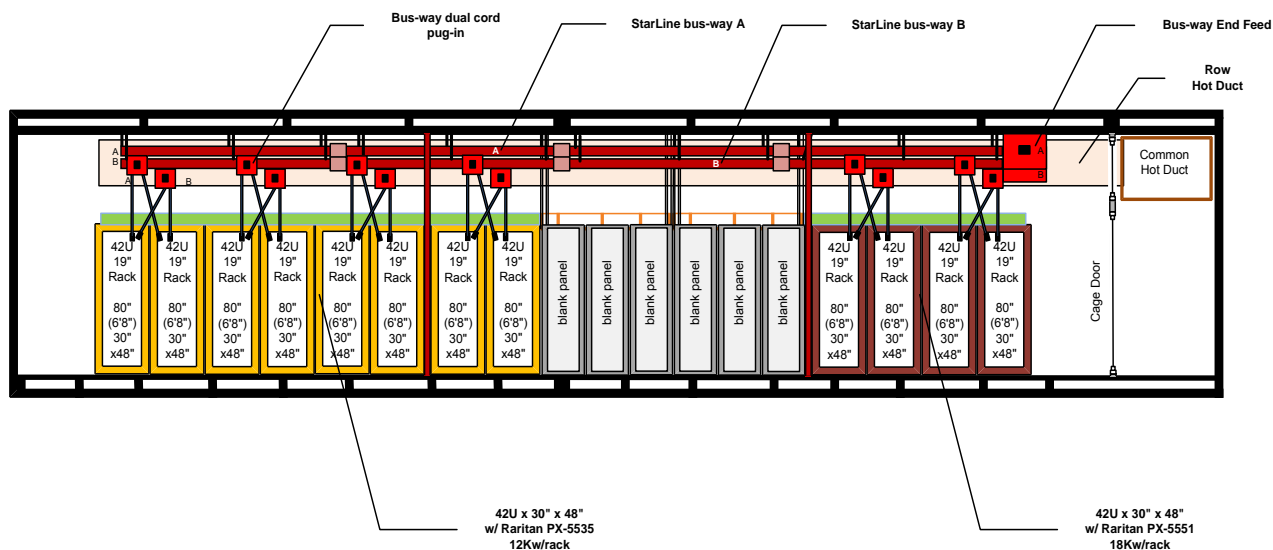
### Starline Bus + Network Cable Management - Mid-Section View



### Starline Bus + Network Cable Management - Cross-Over Section View



The following is the rack-space long-section with the integrated Starline bus system:



## F. Network Cable Management

### Network Cable Management

Network cabling to, from and between racks is accomplished by routing network cables in top of rack cable troughs and in row-to-row network basket cable trays. These are dedicated network and select low voltage control and sensor cable routing.

The rack, cable trough and basket cable tray system provides for retaining, supporting, protecting and providing for proper bend radii appropriate for the given cable size and type.

### Cable Management Components

The following is illustrative of the top-of-rack cable trough system



#### High-Density Cable Organizer

Organize and manage large amounts of cables front-to-rear in compliance with TIA/EIA-568-A bend radiuses (optional).



#### Integrated Trough

Allows for overhead cable distribution in an integrated and enclosed trough (standard).



#### Overhead Cable Management System

Allows users to route cables on top of the enclosure and offers separate trays for power and data (optional).

The following is illustrative of cable management and protection features enabling proper and best cable management practices:



#### Waterfalls

Provide the optimal bend radius for CAT 5e/6 and fiber cables as specified in TIA/EIA-568-A (optional).



#### Vertical Cable Manager

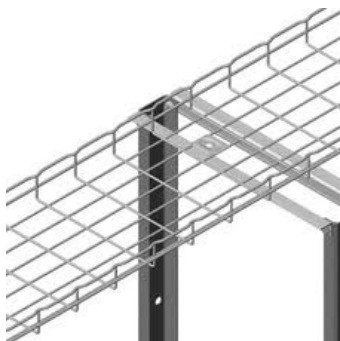
Creates a vertical trough in the side channel that allows up to 300 CAT 5e/6 fiber cables (optional).\*



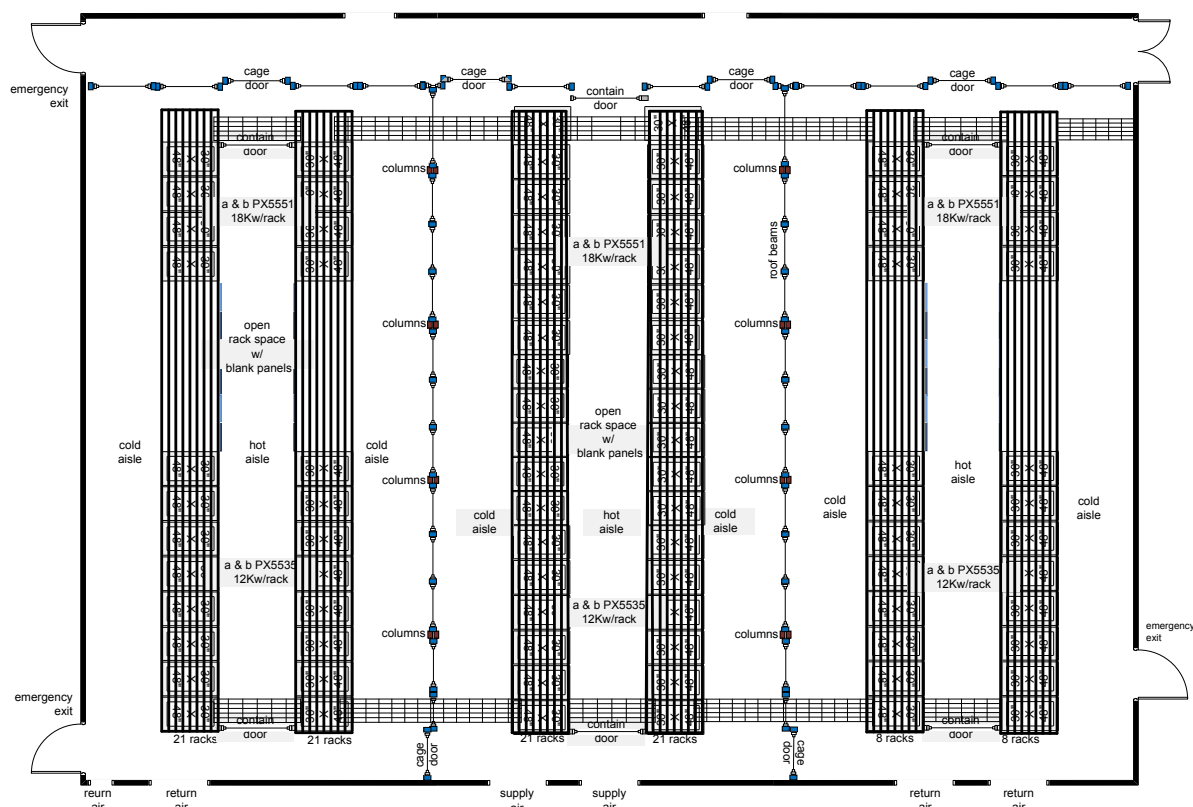
#### Top Cable Ports

Allow cables to be dropped from overhead (standard).

The following illustrates the components of the basket cable tray:



### **Network and Controls Cable Management Plan**



### **Other Cable Management**

Other power cables for plug loads, to mechanical and electrical equipment is routed and installed in conduit. Low voltage controls, security, fire and lighting are installed according to local/national code and industry best practices.

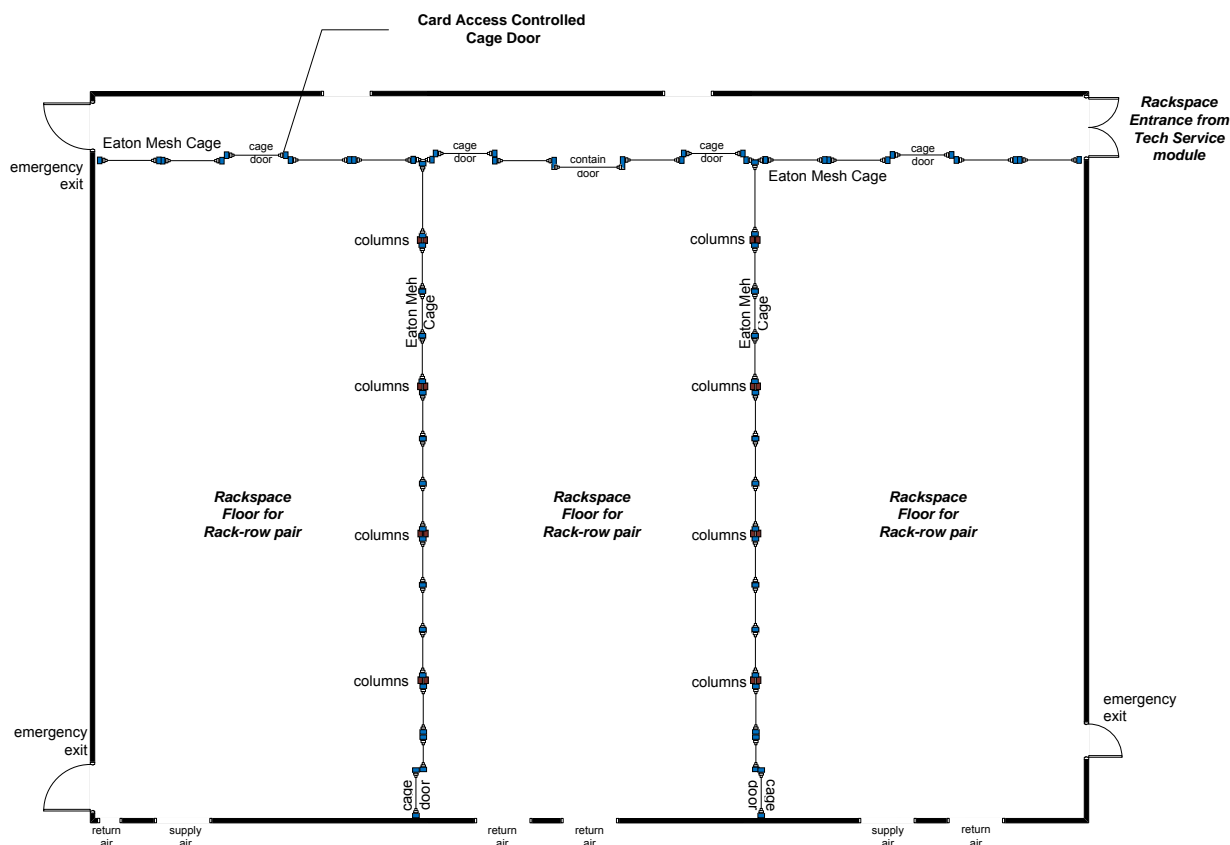
### Security cage with card access

Provide mesh cage security system which separates the three IT racks. The system will be complete with security door hardware and card access control card readers.

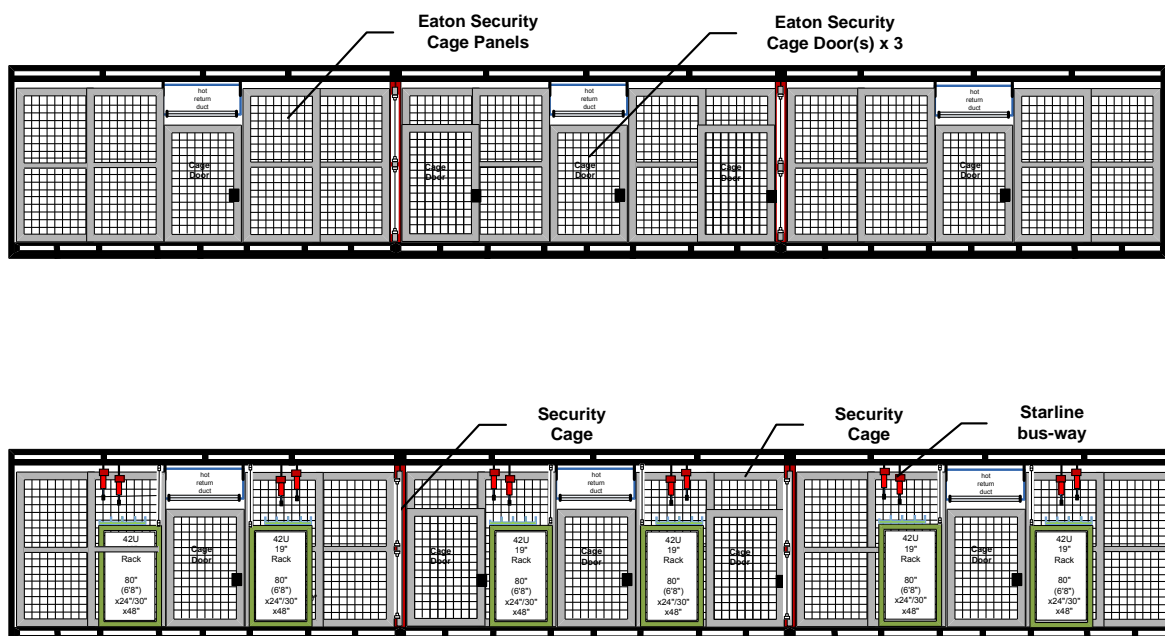
The proposed implementation of the Eaton mesh security system provides secure controlled access to three data center areas, each being a 42ft long rack row pair. Each rack-row pair area is access through three (3) doors each having an access control card reader and corresponding electronic lock release.



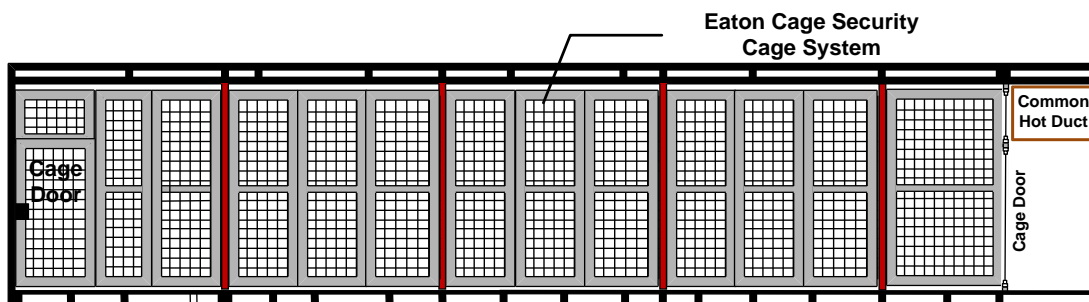
**Eaton Cage – Plan View**



## Eaton Cage – Section Views



## Eaton Cage – Long Section View



Each rack-space area secured by the mesh cage has a emergency exit direct to the outside. Also, all cage doors are automatically released on the open position (unlocked/unlatched) upon an emergency fire alarm event.

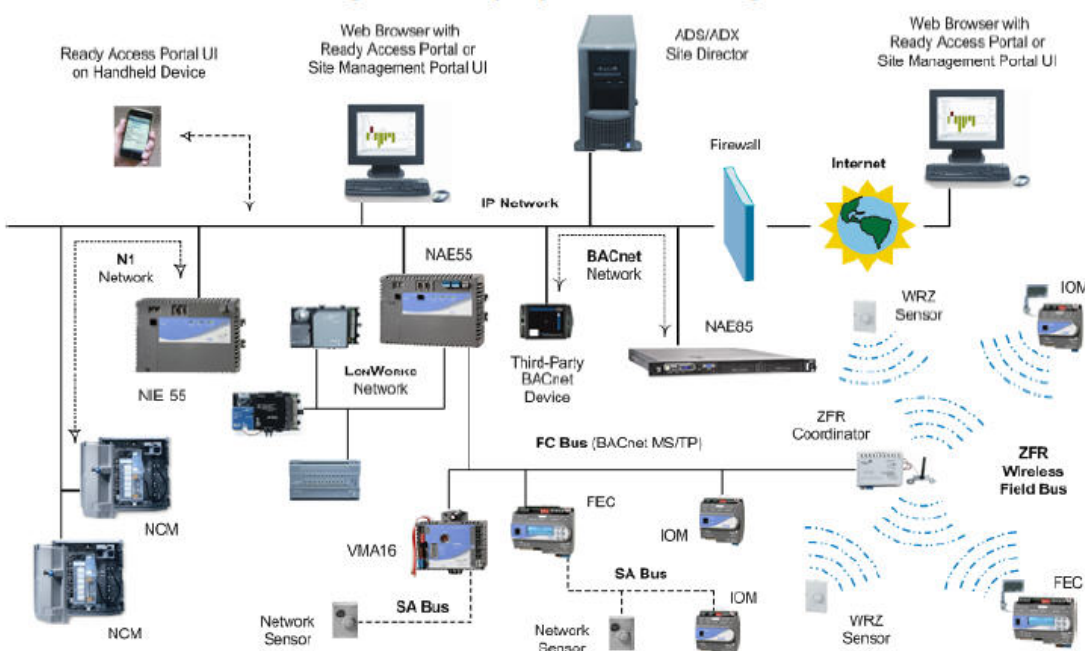
## G. DCIM and Environmental Monitoring and Management

### Johnson Controls Metasys Building Management System (BMS)

#### System Capabilities

The Metasys architecture has evolved to bring the benefits of the latest computing and communication technologies into building automation and data center management. While maintaining all the basic features of a building automation system, the Metasys system embraces the standard and open technologies of the IT and Internet age, enabling the system to be fully integrated into the information and networking infrastructure of buildings and enterprises. The management of information and its electronic distribution provide extra value to the building owner and operator, along with more efficient day-to-day operation. Enhanced access to data is available for performance analyses and financial planning. The integration of systems and devices from other manufacturers has always been a major feature of the Metasys system. DIA shall provide server rack space, power, and connectivity for Metasys server, integration server, and DCIM servers.

**Figure 3: Metasys System Network Integration**



#### User Interface (UI) Experience

Today's data center managers and operators demand an experience that is intuitive and easy to use without special training or complex technical manuals. The Metasys user interface offers a textual summary display of important building automation data as well as fully integrated dynamic graphical displays with smooth navigation. A computer with a Web browser is used to log on to any site. The Metasys system user experience is a portal into a site. It can be tailored to fit the needs of all potential system users. The Site Management Portal provides system administrators or data center operator's online user and system configuration capabilities along with real-time views into their site's systems. The



Site Management Portal transforms the raw data from the site and organizes it into a comprehensive set of information management tools and reports.

### **Data Center Control Through Graphics**

The evolution of the Metasys system has also spurred an evolution in graphic offerings as new software technologies have emerged. Data Center control through graphics is available from a standard graphic created with the User Graphics Tool (UGT). The graphic solution offers rich, customized graphical views of a site's floor plans and systems. Full monitoring, control, and navigation capabilities are available from the graphic, offering the user an intuitive method of managing the daily events of building control. In addition, an extensive library of templates, symbols, and controls is provided with the Graphic Generation Tool, simplifying the task of graphic creation. Once the images are saved to the system, the UI uses color and animation to effectively display the condition of monitored systems and provide the operator with methods of commanding and navigating the facility.

### **Information Management**

A BMS is not only a control system but also a source of valuable information for the management of your data center. The Metasys system transforms raw data into valuable support information that authorized users or business and enterprise systems can access on the network. Trend logs, historical data, transaction logs, audit trails, and diagnostic reports are all available to the user who can generate customized reports to meet local management requirements.

### **Advanced Reporting System**

The Web-based reporting option provides standard report sets to allow users to review the alarm and trend configuration of the site; run summary and detail reports to monitor alarm and event information; view offline information; combine alarm and audit information in a single report; and view trend summary or detailed reports.

### **Energy Management Tools**

Metasys provides a complete suite of powerful energy management tools to help you manage energy use in your facilities and reduce your energy costs. Energy management features include Scheduling, Temperature Reset, Hot Aisle Containment, and Custom Programs. The BMS will output all data into the DCIM program for customized real time PUE monitoring and user dashboards.

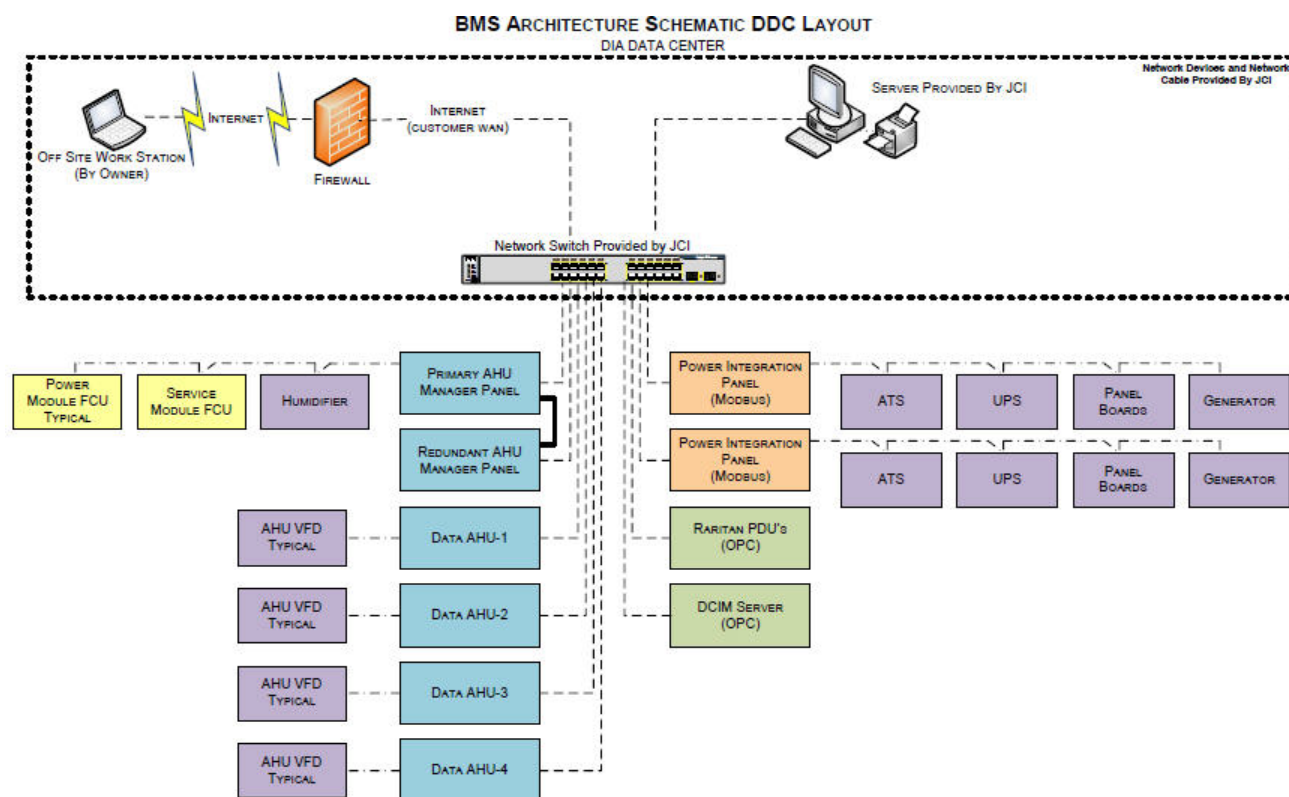
### **Systems Integration and Connectivity**

The Metasys system has always been a means to integrate multiple systems to provide a common user experience. It uses a combination of standards and open protocols from both the IT and building automation industries to extend the integration beyond the data center managers.

### **Tier III Compliance**

The BMS is designed to operate on UPS power and has a redundant AHU controller arrangement to meet the Tier III standard.

## DIA Data Center BMS and System Integration Architecture



## JCI DCIM Real Time PUE Monitoring

This program will be fully implemented with data base and user graphics and PUE dashboards. This program will monitor all data center facility infrastructure electrical and mechanical systems, provide real time data acquisition/logging, perform analysis including trending, and will provide visual display and reporting of PUE, other key metrics (Energy Efficiency, Air Management/Distribution, Air Handling Units, Hot Aisle Containment, Humidification, Electrical Power including generator/ATS) and of associated measurements/variables.

Critical equipment and system temperatures, pressures, flow rates, voltages, current, power, and other measurement/system variables for data center air flow, humidity, and power systems are monitored.

Data center metrics/analytics for energy, efficiency, economics, cooling system performance /status (airflow subsystems) and power system performance/status (UPS, branch circuits, generator/ATS) are provided.

For example, DCIM provides real-time PUE metric (e.g. current performance, rolling 12 months), trends, statistics and similar results for underlying IT power and total facility power. PUE data, underlying data and associated trends/statistics are stored in the SQL data base for which reports can be generated. The DCIM has three sources of inputs which are consolidated into an SQL database: 1) Metasys: real-time points including systems integration; 2) Script file: calculated points; 3) Excel spreadsheet: manually-collected points.

For this project, JCI will define all of the points necessary to display the specified metrics and measurements. Other data points can easily be added by the user.

Metasys DCIM provides real-time point data to the SQL database either from directly-connected instruments or through high-level integration with other data center system (BMS, UPS, PDU, ATS,



Panelboards, Generator, VFD's, Humidifier, etc.). The following is our system architecture design for the DIA data center.

The DCIM will integrate with the power distribution units and bring all the data into the DCIM package for monitoring. Strategies can be developed and documented for managing changes to the DCIM when data center IT load moves, adds, changes, refreshes occur. DCIM elements to be considered include: instrumentation/sensors, integrations, point names mapping, alarm/alert schema, control and operations strategies.

The common DCIM Platform installed at the side will collect and aggregate data into a common platform SQL database by integrating collected data from existing systems and installed sensors/instrumentation, analyze the data including trending, provide visualization/display and reporting of key metrics and associated, underlying measurement/variables. The DCIM includes Metasys controls to perform data aggregation and integration of subsystems, DCIM Dashboard software and a DCIM SQL Database. The implemented platform will be capable of more than 2X expansion in data aggregation/integration, metrics computed/analyzed and data stored at each included site.

DCIM metrics/point data can be moved to/from other platform systems as may be required. Alarms/alerts can be pushed to other systems via SNMP or other communication methods.

### Knowledge: Basic Visualization



*User Can Instantly Switch Display Formats for a Single Metric*

## DCIM Dashboards

For this project, Johnson Controls will also provide for each site:

- A power data center space graphic
- A cooling data center space graphic
- A power single line diagram graphic
- A cooling single line diagram graphic
- A graphic for each piece of power and cooling equipment

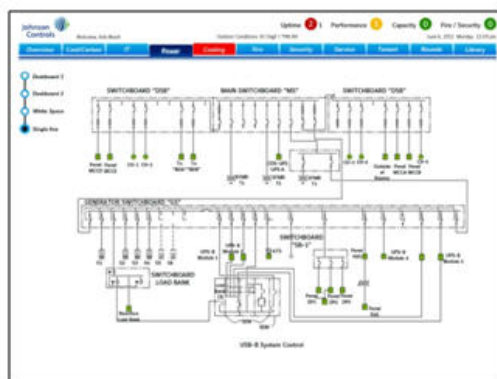
For an integrated view of the data center, real-time points, rounds and readings points and calculated points can appear as part of the same graphic or as part of the same dashboard.



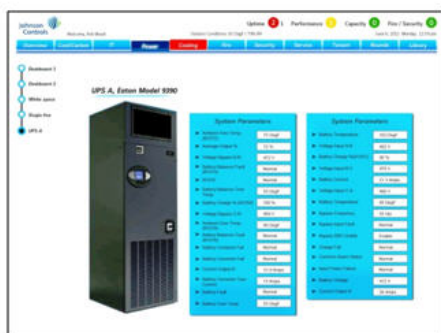
Sample Dashboard



Sample White Space Graphic (Cooling)



Sample Single Line Graphic (Power)



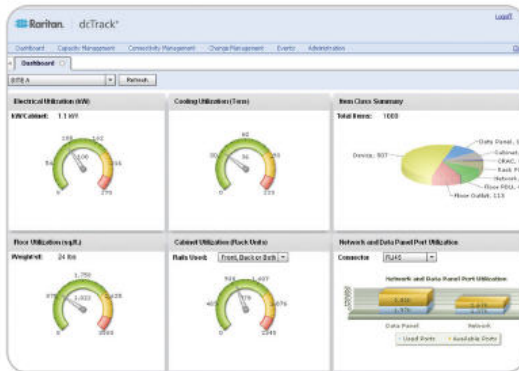
Sample Equipment Graphic (UPS)

## Data Center Cooling, Electrical, and UPS Sample Graphics

Raritan dctrack DCIM - The software shall be furnished and installed on a DIA owner furnished server. The data base development and asset data base is not included in this project.

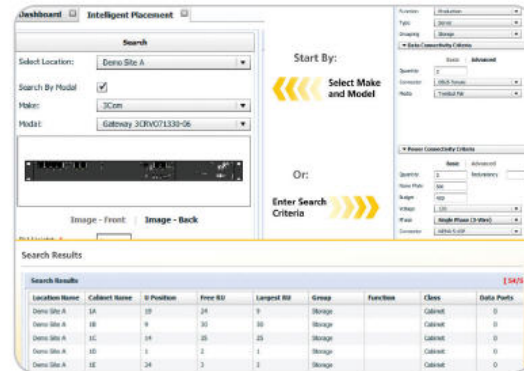
### Capacity Management Dashboard

dcTrack provides real-time resource utilization data for better electrical, cooling, floor, cabinet, cable and network capacity planning. Quickly see how much capacity you're using and, more importantly, how much is available.



### Intelligent Search, Place and Reserve

Quickly find space, power and network connectivity for IT devices, simplifying capacity planning and change management. Reserve capacity for future provisioning of new IT equipment.



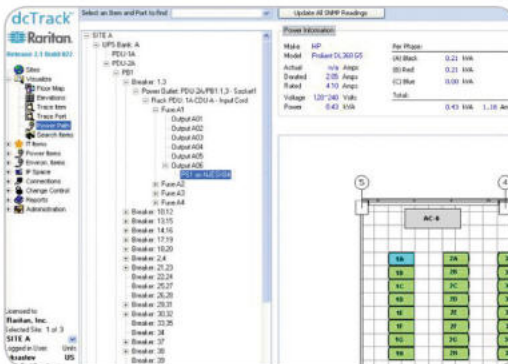
### Complete Power Distribution Management

dcTrack uniquely offers complete power chain management. Power management begins with the UPS power feeds, supporting virtually any type of power distribution design. This screen displays the circuit breaker panel.



### Visualize Power Path

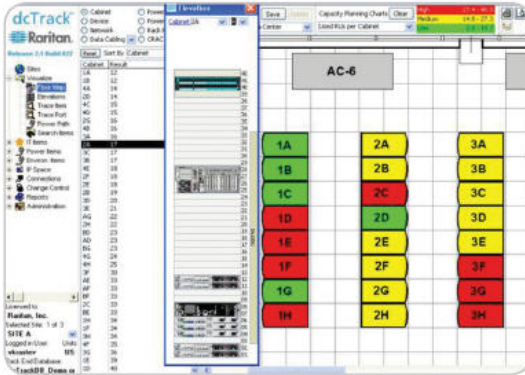
dcTrack offers a unique tool to visualize the full electrical circuit – from the data center power source to the rack PDU receptacle. dcTrack automatically calculates the power load at intermediate points in the electrical circuit path.





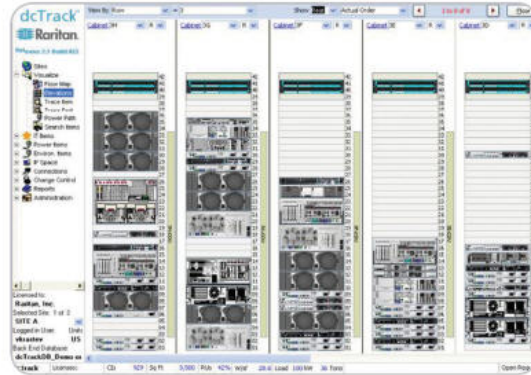
### Visualize Floor Map

The data center floor map is linked in real time to AutoCAD or Visio floor plans. CAD drawing changes are immediately visible and recognized as new dcTrack objects. Customers can use multiple color-coded charts to view heat, space, weight and power load distributions.



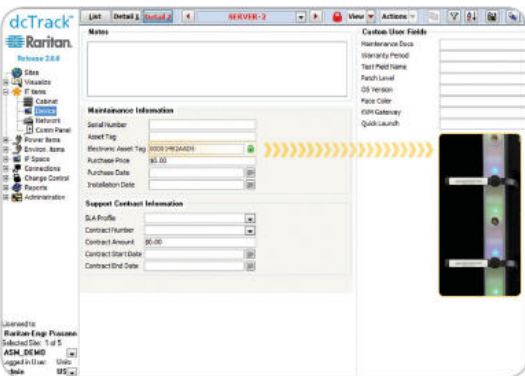
### Visualize Cabinet and Row Elevations

dcTrack can visualize a group of cabinet elevations. Cabinets can be grouped by data center rows or logical groupings. With another click, the elevation views can be changed to front, rear or descriptive text views.



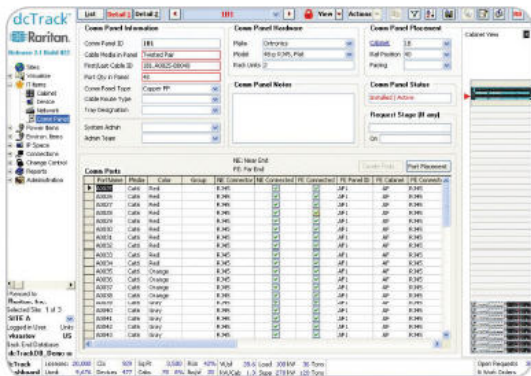
### Intelligent Asset Tracking Integration

With Raritan's unique Asset Management Tags and Asset Management Sensors (AMS), dcTrack provides an accurate, automated, real-time inventory of all IT assets and their locations, down to the 1U level.



### Network Connectivity and Data Cabling Items

dcTrack supports all known cable types, connectors and topologies. Users can manage real-world cable infrastructure and labeling scenarios, with support for various design architectures.



## H. IT Racks and Power Distribution Units (PDUs)

### IT Rack System

84 Eaton Paramount 42U X 30" W X 48" D racks are included as follows:

#### Rack Row Area 1 and Area 3

- 8 Eaton racks 30"x48"
- 16 racks 30"x48"
- 12 24" blank rack spaces for SAN device or other use. Provide floor-to-ceiling panels to maintain hot aisle integrity.

**Rack Row Area 2**

- 12 racks 30"x48"
- 24 racks 30"x48"



The Paramount platform not only supports industry leading equipment weight loads in a fully welded frame, it is also designed to adapt to the ever-changing requirements of the data center through a scalable and modular approach, protecting your initial investment.



### Paramount High Flow Doors

Eaton's high flow doors offer exceptional airflow with 75 percent perforation, a 17 percent increase over the industry standard. In addition to increased performance, the unique perforation pattern results in a reduction of raw material consumption by over 60 percent which means less waste in the manufacturing process—a great “green” benefit.

Speed of deployment is essential to any company when considering time to market. Paramount's modularity and building block design ensures quick reconfigurations and minimizes downtime, protecting your initial investment.



### Rack configuration

Eaton's Rack Hygiene configuration offers enhanced features for high-density cooling and containment. The new frame ensures zero air leakage around the front perimeter of the unit and includes Eaton's high flow door which features 75 percent open perforation pattern.

#### Rack Hygiene configuration features:

- Enhanced frame ensures zero leakage around the front perimeter and also features oval grommets in front frame verticals for cable pass-thru between racks
- High flow single front door with 75 percent open perforation pattern
- High flow split rear door with 75 percent open perforation pattern

- Top panel with two six inch wide brushed openings for cable egress
- Divider panel with cable pass-thru installed on left side only
- 19 inch EIA-310 vertical mounting rails (quantity four) with U-markings
- Vertical blanking panels (quantity two) with cable pass-thru for 30 inch wide models only
- 2U cable management rings (quantity four) pre-installed in rear right frame vertical
- Grounding pre-installed
- Color: Black

**Power Distribution Units (PDUs)**

The Raritan PX PDUs included in our proposal provide real-time remote power monitoring of current (amps), voltage, power (kVA, kW) and energy consumption (kWh) with +/- 1% accuracy.

**Rack Row Area 1 and Area 3**

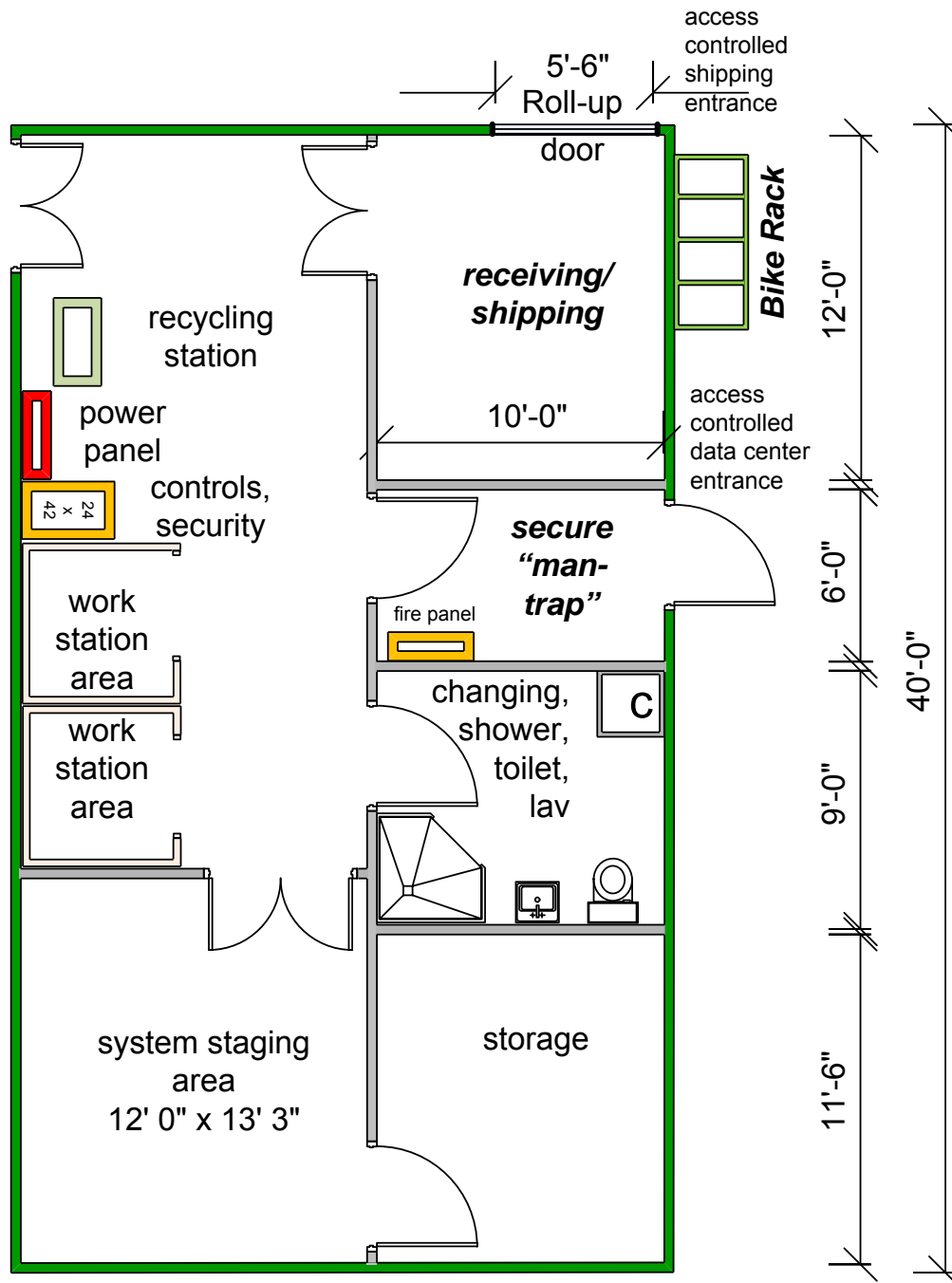
- 8 Eaton racks 30"x48" at 18 KW each with two Raritan PX-5551.
- 16 racks 30"x48" at 12 KW each with two Raritan PX-5535.

**Rack Row Area 2**

- 12 racks 30"x48" at 12 KW each with two Raritan PX-5535
- 24 racks 30"x48" at 6KW each with two Raritan PX-5660

## I. Ancillary Spaces

The following space layout will be provided in the Service Module:





**Space descriptions**

The designated spaces and features will be provided:

- Secure Man-Trap Entrance Area
- Shipping / Receiving Area
- Re-Cycling Area ( LEED )
- Data Center Operations Work Areas (2)
- Restroom
- Equipment Staging and Parts Storage
- The module walls and roof are to be the color white for LEED credit.
- Ancillary area doors are to be FSC certified wood for LEED credit.
- A bike rack has been shown for LEED credit.
- A small janitor chemical closet with exhaust has been added in bathroom for LEED credit.
- The module walls and roof are to be the color white for LEED credit.
- Outdoor lights are to be LED for light pollution control for LEED credit.
- The existing IT module width has been decreased by reducing the amount of flashing between modules from 22 inches to 6 inches.

**Secure Man-Trap Entrance Area**

This area consists of an exterior entrance door with and card reader and camera. A mantrap, also known as a security vestibule, is a secured space equipped with two or more interlocking doors and a single person detection system to insure that only one person can pass through into a high security area such as a data center. Once inside the mantrap the exterior door must close and be secured and then the person will use a second card reader to open the interior door. The opposite logic exists when leaving the data center. The fire alarm panel shall be located in this area to allow firefighters control access in case of fire. The area shall have fire protection, HVAC and lighting. This system prevents tailgating and piggybacking.

**Shipping / Receiving Area**

This area consists of an entryway with a rolling overhead door with a concrete ramp from the exterior to allow equipment to be transported into and out of the data center. A set of double doors provides access into the data center service area. A third set of double doors allow access into the IT /server room. These areas allow the space to be environmentally controlled and prevent dust and dirt from moving into the IT Server room. Shelving will allow for materials to be available to uncrate or un-box materials along with materials to prepare equipment for shipping.

**Re-Cycling Area (LEED)**

Containers shall be placed within the space to allow for a data center re-cycling program. Waste materials shall have separate containers to allow for separation for re-cycling.

**Data Center Operations Workstations (2)**

**DIA Data Center / Denver International Airport**  
**Denver, CO | Contract No. 201310374**



Individual office wall partitions shall be provided. A rea shall be designed for future office furniture and space for a computer workstation, furnished by DIA.

Workstation of fices shall have 40 inch wall mounted LCD display to view and monitor data center systems. All data center systems including DCIM, BMS, security, IT and other designated systems shall be monitored and controlled. A n operator workstation shall allow operations personnel to view and operate the systems within the data center. Screen shall be able to utilize split screens to monitor various systems on the large screen simultaneously.

### **Restroom**

This area shall consist of a sink with base cabinet, lighting fixture, mirror, toilet, hand towel dispenser, water heater, drain, and accessories. Plumbing faucet, shower head and toilet will be low flow for LEED credit. A small janitor chemical closet with exhaust has been added in bathroom for LEED credit.

### **Equipment Staging Area and Parts Storage**

This staging area shall be used to prepare equipment for deployment into the data center. Equipment setup and provisioning shall be performed. A double doors shall allow for wide equipment to be transported into the room. A parts storage area with lockable door shall be provided.

## **J. Site Security and Life Safety Systems**

### **Fire Alarm System**

Johnson Controls to provide an Addressable fire alarm system that is UL listed for Releasing as well as monitoring the Vesda (Air Sampling) system. Fire alarm devices will be located as required to comply with applicable NFPA codes and ADA guidelines. The Fire Alarm Panel is equipped with dry contacts if owner chooses to monitor panel from Airport Fire Alarm System. JCI will submit drawings to County and City of Denver for Plan Review and Approval. Permit Fees have been included in this proposal.

#### Factory Approach:

Johnson Controls factory installed approach will include the following scope of work:

- Provide and install an Addressable Fire Alarm control panel at the factory in conduit that will provide a compliant fire alarm system as well as provide releasing for the Fire Suppression System.
- Provide and install Addressable Air Sampling Smoke Detectors at the factory in Data Center Space to include (3) modules in current design. These detectors will be connected to the SLC (Signaling Line Circuit) within the module, the last device on the circuit before it enters the next module will allow for enough cable to connect to the next addressable device in the adjacent module.
- Provide and install Addressable Pull Stations at the factory throughout the modules. These pull stations will be connected to the SLC (Signaling Line Circuit) within the module, In the event this is the last device on the circuit before it enters the next module, it will allow for enough cable to connect to the next addressable device in the adjacent module.
- Provide and install Addressable Releasing Modules at the factory for the FM200 system. These modules will be part of the signaling line circuit.
- Provide and install Addressable Duct smoke detectors at the factory. These detectors will be equipped with a remote test switch and connected to the signaling line circuit.
- Provide and install Addressable Heat detectors at the factory in the power modules. These detectors will be connected to the signaling line circuit.
- Provide and install Notification Booster Power supplies at the factory to provide power for notification devices throughout all the modules.

**On-site "Field" Approach:**

Johnson Controls On-site field installed approach will include the following scope of work:

- Connect signaling line circuit within each module.
- Provide on-site start-up of system after connections.
- Provide check-out and test of system.
- Provide training to owner's designated representatives.

**Fire Suppression System**

Johnson Controls to provide a Fire Suppression System (FM200) that will be installed in the (3) Data Center modules. This system will be released by the addressable fire alarm system (UL Listed for Fire Suppression Release) in a cross zone method. Activation from both the area smoke detectors as well as the air sampling detectors will have to be in alarm prior to the release of the fire suppression system. Releasing Stations and abort switches will be installed throughout the Data Center Space. Notification devices will be located throughout the data center space to alert on pre-alarm and discharge alarms. A door fan test has been included in the base bid to ensure room integrity prior to final commissioning of system. A gas dump test has been provided as an additive alternate. JCI will submit drawings to County and City of Denver for Plan Review and Approval. Permit Fees have been included in this proposal.

**Factory Approach:**

Johnson Controls factory installed approach will include the following scope of work:

- Provide and install Fire Suppression Tanks.
- Provide and install Fire Suppression Piping.

**On-site "Field" Approach:**

Johnson Controls On-site field installed approach will include the following scope of work:

- Connect fire suppression piping in modules via steel braided high pressure hose.
- Provide on-site start-up of system after connections.
- Provide check-out and test of system.
- Provide training to owner's designated representatives.

**Access Control System**

JCI will provide an Access Control system that is compatible with existing Airport system. With the current design, Card access will be installed on two ) doors in the secure "man-trap" entry. One (1) card reader shall be installed on door between ancillary area and IT server area. Two pedestal card readers (one IN reader and one OUT reader) will be mounted at the entrance to the automatic security gate to allow vehicle access. Three (3) card readers shall be installed on cage doors. Door contacts will be installed on the emergency exit doors to the IT module as well as the power, modules for monitoring purposes. The access control system will be installed and tested to ensure communication between the field devices and module control system is active and free of faults. It is assumed that Airport personnel (as done on previous projects) will conduct the programming of the system to the existing Airport database. Network connectivity will be provided to the new access control unit. JCI will submit drawings to County and City of Denver for Plan Review and Approval. Permit Fees have been included in this proposal.

**Factory Approach:**

JCI factory installed approach will include the following scope of work:

- Provide and install card readers, door contacts, access controllers at the factory for devices shown on JCI drawings as well as described in the above design narrative. Each access controlled and monitored door will homerun back to the access control panel that is located in the Tech Service module

- Provide and install Access Control panel.
- Install devices and provide cable in each module that will be long enough to provide a continuous run to the access control panel once all the modules are installed and connected.

**On-site "Field" Approach:**

- Provide on-site start-up of system after connections.
- Provide check-out and test of system.
- Provide labor for connections of pre-installed access controlled devices.

**Video Surveillance System**

JCI will provide camera coverage to include; interior IP camera in secure man-trap and two interior IP cameras for general data center space, (8) exterior fixed IP mega pixel cameras will be mounted on technical service module, power modules and IT modules to view perimeter around module complex. (1) Additional exterior fixed mega-pixel camera will be provided to monitor vehicles entering the site at the automatic security gate. JCI will also provide a POE switch for connectivity and power to the cameras. It is assumed that Airport personnel (as done on previous projects) will provide and assign IP addresses and conduct the programming of the system to the existing Airport Video Management system database. Network connectivity will be provided to the new POE switch.

**Factory Approach:**

JCI factory installed approach will include the following scope of work:

- Provide and install interior cameras at the factory. Each camera will homerun back to the POE switch that is located in the IT module. Cameras that are mounted on other modules that the Switch does not reside in will have enough cable at each camera to provide a continuous run to the switch once the modules are installed and connected.

**On-site "Field" Approach:**

- Provide on-site start-up of system after connections.
- Provide check-out and test of system.
- Provide labor for connections of pre-installed cameras.
- Provide training of the system as described above.
- Install exterior cameras to the module once they are connected. Cable will be provided at the module camera location and onsite connection will have to be made to the POE switch.

**Emergency Power Off System**

JCI will provide an Emergency Power off system. JCI will submit drawings to County and City of Denver for Plan Review and Approval. Permit Fees have been included in this proposal. The emergency power off system will consist of (2) shunt trip breakers, (4) Manual shut-off stations, and (1) control panel. Upon Receiving a pre-alarm condition from the Fire Alarm Control Panel the system will shut down all non-critical equipment, upon activation from the second alarm the system will shut-down all critical equipment.

**Factory Approach:**

JCI factory installed approach will include the following scope of work:

- Provide and install an Emergency Power Off control panel.
- Provide and install manual emergency shut-off stations.
- Provide and install shunt trip breakers.
- Install Interconnect between EPO Control Panel and Fire Alarm Control Panel

## **K. Environmental Mitigation**

### **Environmental Robust Design (including Ballistics, EMI/RFI shielding)**

A fundamental standard is to design, construct and test our modules for robust resistance to environmental threats: wind, wind driven rain, torrential rain, heavy snow & ice loads, seismic events, wind driven projectiles, dust/dirt, wind driven debris including dust/dirt/sand. For DIA, Johnson Controls will design for 160mph wind and rain, debris driven by such wind. We will design for seismic zone D which is higher than the seismic zone designated for Denver. The envelope skin and doors and penetrations will provide sufficient shielding to attenuate 22dB. Testing and compliance evidence will be created and made available for review by the project. These specific requirements – RFP, others and our own standard design guideline requirements Our enclosure standard requires all seams and doors/portals/penetrations be installed with a gasket.

## **L. Enclosure NEMA Ratings**

Johnson Controls modular data center engineering design standards and guidelines include practices and designs that comply with NEMA standards by either integrating components (or example, our electrical equipment is provided by the manufacturer in NEMA rated enclosures that have the requisite NEMA rating or designing to NEMA requirements and similar other standards (e.g. NFPA 70). Johnson certifies NEMA compliance/ratings and describes, in detail, in all submittals what NEMA ratings are applicable. Compliance/rating evidence can be provided. Our Modular Engineering Design Guideline describing our compliance and rating practices is available for review.

## **M. Telecommunications**

### Fiber OSP:

Redundant single-mode, indoor/ outdoor rated fiber connections from an existing OSP fiber infrastructure. Trenching, pathway and associated exterior spaces necessary (vault, hand-holes, etc) shall be provided by others. The infrastructure shall be a full and complete system from the point of interception to the equipment cabinets within the facility.

Dual/ redundant quantities of optical fiber from the OSP intercept points, routed through provided pathways into the building, and terminate within the appropriate distribution cabinets. One feed shall be terminated per cabinet, two cabinets total.

Interception point termination shall be made with a fusion splicing device, and shall adhere to all best practices/ industry standards and manufacturer recommendations for tolerances and successful commissioning. Termination type shall be LC, and mounted within the rack mounted enclosures with a minimum capacity of ninety-two (92) strands of fiber. Enclosures bulkheads shall be fully loaded with F-F LC terminations to allow for fiber patch cable cross-connection to the terminated OSP fiber cable. One enclosure per cabinet.

Provide full testing from both ends of the fiber infrastructure to ensure full commissioning after completion of the installation. PCL is NOT be responsible for the condition of the current fiber infrastructure from the DIA facility up to the point of interception outside of the new facility.

### Rack-mounted fiber enclosures (to be sent to plant for installation):

- Corning Cable Systems: Maximum of 4RU, 96 strand enclosure, fully loaded with LC bulkhead termination plates, or equal.

All installed fiber cabling shall be tested for compliance with local, national and industry acceptable standards.



**Fiber Optic Cable Pathway Infrastructure:**

The low-voltage fiber optical contractor prior to full excavation of the man-hole location, and placement of conduit pathway. Conduit pathway shall be as shown on the utilities drawing. Within the facility, the conduit pathway shall be a continuous pathway from the core equipment cabinets to the exterior wall where the entrance conduit is anticipated.

**Grounding and Bonding:**

The bonding infrastructure internal to the modular data center buildings into the power modules for bonding to the building electrical ground. There shall be grounding busbars within the data center modules, and all bonding work within the buildings shall be completed prior to site delivery. The contractor shall extend the grounding infrastructure to the power modules with code compliant bonding conductors (minimum of 0(1/0) is anticipated), sized with approval by the local AHJ.

**N. Site Design and Considerations****Storm Drainage**

Proposed storm drainage will consist primarily of overland and sheet flows to historic discharge points at the southwest corner of the site. The Facility module roof drains will discharge to splash blocks which will, in turn, be directed away from the building to flow into landscaped areas. The proposed parking and access road areas will sheet flow to surrounding landscaped areas for eventual discharge to the ditch system along the east side of Valley Head. Flows are not required to be detained or treated for water quality as a part of this project. A culvert will be placed beneath the access drive to accommodate flows along the east side of Valley Head.

The primary off-site consideration for this project is the drainage being released from the kennel site. It is assumed that the kennel project was designed to release developed flows undetained as has been indicated for this project, so it is assumed that the eastern Valley Head ditch will be in a developed conveyance drainage condition by the time it reaches this Data Center site. No other off-site considerations are anticipated.

Coordination will occur between this project's construction activities and the overall environmental permitting currently in place at DIA. The design-build team will work with DIA Environmental personnel to satisfy the requirements of sediment and erosion control during construction as well as CDPHE requirements for construction pollution-prevention activities.

**Grading**

Site grading activities will consist first of the clearing and grubbing of existing vegetation and organic material. After this initial exercise, the site will be fine-graded to support the site improvements and the new facility. Extensive grading operations are not anticipated. Drainage from the facility will outfall to the surrounding landscaped areas, generally mimicking overall historic flow patterns to the south and west. Stormwater detention and water quality provisions are not necessary or included for this project.

**Utilities****Existing Utilities**

Electric power and communications infrastructure exists just to the west of the DIA Data Center and the new facility will tie into these existing utilities. There is also a water main west of the facility in Valley Head Street that will be tapped for the project. Our pricing is based on these existing utilities being sufficiently sized to serve this project. Our pricing is based on XCEL Energy providing and installing the two primary transformers and utility runs as indicated on our Site Utility Plan with the cost to be borne by others per DIA. Timing of XCEL installation is to be compatible with the project construction schedule. We have included fiber from the existing street location to the new building.

**Water Supply and Distribution**

A water service line sized for facility support will be installed from the main to a new water meter assembly and backflow preventer. From the meter, the water service will continue into the site and will feed the facility. Domestic water service will consist of a service line to the Air Handling Units and a service line to serve the restroom. A fire hydrant will also be installed to provide fire protection for the facility. This hydrant will be a separate tap to the main in Valley Head Street. A Knox box will be provided at the gate for fire department access. Water tap fees are included. Costs (if any) for development fees and zoning fees are excluded.

**Sanitary Sewer Line and Lift Station**

We have included a sewer line from the data center to the closest sewer line connection on the dog kennel site. This sanitary sewer service will discharge to a pre-packaged lift station and flows will be pumped northbound via a force main to existing sanitary main facilities. An electrical feed will be provided from the building to the lift station.

**Slab and Foundations**

We have included a structural slab on grade beams and caissons per the original RFP Exhibit A,5.4.2.2 to support the load of the Data Center Facility. No soils report for the Data Center site was included with the RFP. As a result, our foundation design is based on the K9 Dog Kennel Soils Report that was provided with the RFP. Our current proposal includes costs to perform a geotechnical investigation and provide a site specific Soils Report for the data center jobsite. If the actual geotechnical information identified in the new project specific Soils Report differs significantly from the K9 report resulting in added costs, it would be an unforeseen condition and we will be submitting additional costs incurred to the owner for payment.

Concrete slab and foundations below a future single IT module (2 sections) are included.

Concrete slab and foundations below the future generator, future power modules and empty ductbank between future generator and future power module are also included.

**Preliminary Pavement Design**

The access road and parking spaces surface will be confirmed during the design process. Please refer to the geotechnical information regarding the design criteria and suggested flexible pavement section for this project.

**Fencing**

Chain link fencing and an electrically powered sliding vehicular gate will be provided around the facility for security. Fencing shall be six foot high with (3) strands of barbed wire and DOS K8 / P2 anti-ram cable system which includes:

- 2 7/8" & 2 3/8" SS 40 posts set in concrete footings
- 1 5/8" top, brace rails and bottom 7 ga tension wire
- 2" x 72" x 9 ga chain link
- Cable system (3) 7/8" cables

The electrical vehicle gate will be installed with card readers for access to the Facility. No personnel gates are included.

**Landscape Design**

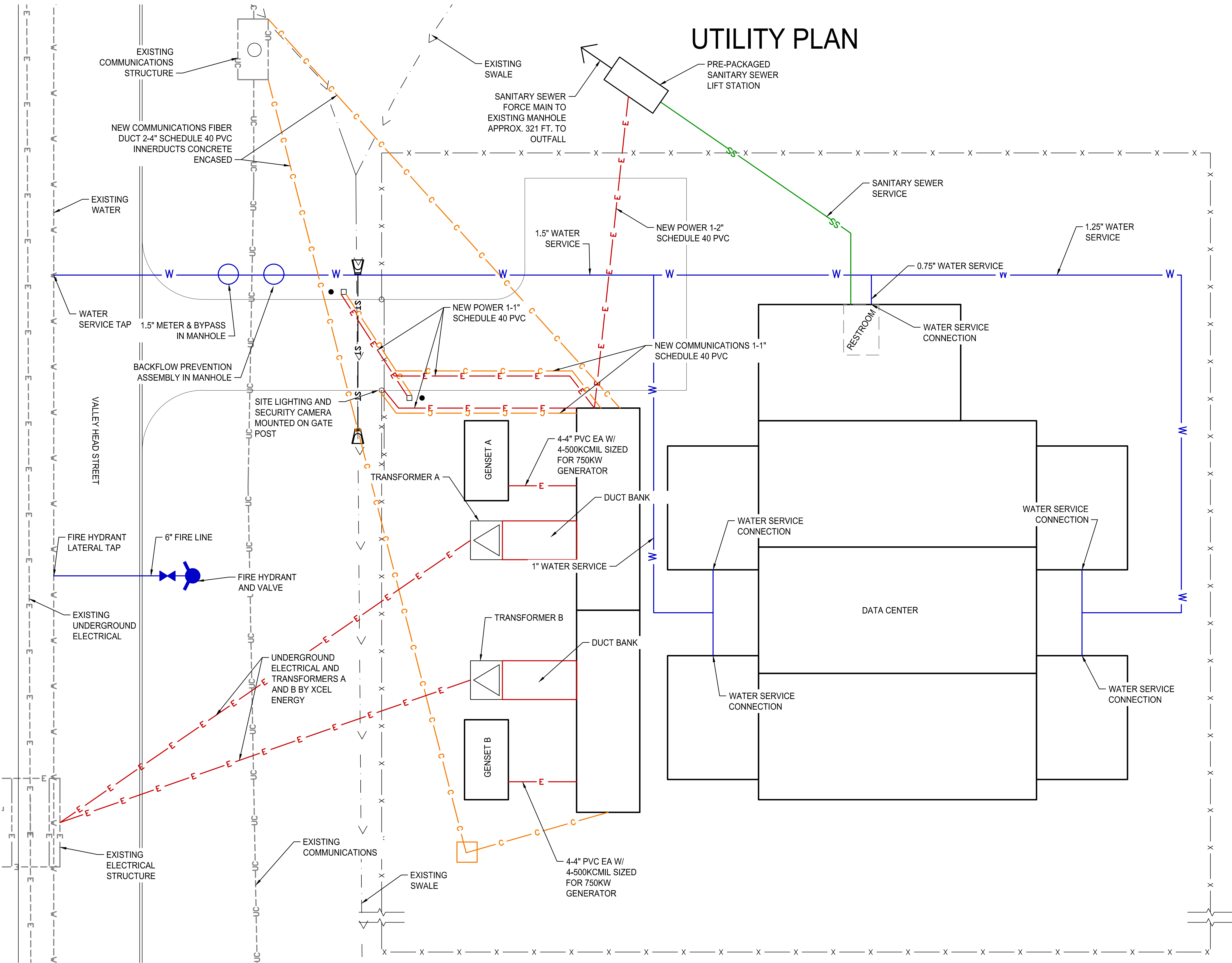
Rock mulch will be provided around the facility and exterior equipment. All additional site area that is disturbed will be seeded with a native grass mix and irrigated only temporarily until the grass has been established.

**O. General Clarifications**

- Our proposal is based upon receiving monthly progress payments for materials and equipment delivered to and stored in Johnson Controls' bonded manufacturing warehouse in Indiana, per Title 9 of the City and County of Denver, Construction General Contract Conditions, 2011 Edition for payment.
- The cost breakouts on the Proposal forms are for accounting purposes only and are not stand alone numbers.
- Due to the fluid nature of identifying the optimum solution for this design-build DIA Data Center project, some of the layout images included in this document may vary slightly from each other and will vary from the final design layout, since these drawings and rendering are preliminary and conceptual in nature.
- The original RFP project schedule would have resulted in site and foundations work being performed in the summer, so no winter conditions costs were included. The extended award process has now delayed this work, and it is now scheduled to be performed in the late fall / early winter. Our current proposal is based on the completion of all foundations and slab work prior to the onset of winter and winter heat and protection costs are still not included. We will endeavor to expedite foundations work in order to avoid any of these costs, but if winter heating and protection is required and costs are incurred, these costs will be submitted as a negotiated Change Order for payment.
- Future generators, future power modules, future transformers and future IT modules are not currently included in our scope or pricing.



# UTILITY PLAN



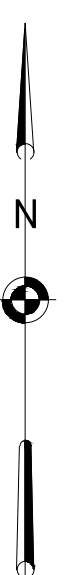
## NOTES:

1. FLEXIBLE CONNECTIONS SHALL BE UTILIZED FOR WATER, POWER AND COMM CONNECTIONS.

## LEGEND:

— ST —	NEW STORM SEWER
— SS —	NEW SANITARY SEWER
— W —	NEW WATER SERVICE
— E —	NEW ELECTRICAL
— C —	NEW COMMUNICATIONS
- - - > - - -	EXISTING STORM DITCH
- - - W - - -	EXISTING WATER MAIN
- - - E - - -	EXISTING ELECTRICAL
- - - UC - - -	EXISTING COMMUNICATIONS
	NEW FIRE HYDRANT
	NEW TRANSFORMER

NORTH



10 0 10 20  
SCALE: 1" = 10'-0"

**DIA Data Center**

Denver International Airport, Denver, CO

**NOTE:** This drawing is for general site and utilities reference only.  
The module layout has been revised as noted elsewhere in Exhibit A.



# **EXHIBIT A-1**

## **PROJECT SCHEDULES AND MILESTONES**

**DIA Data Center**

**Contract Number 201310374**

**June 2013**

**DEPARTMENT OF AVIATION  
City & County of Denver**



**DENVER INTERNATIONAL AIRPORT**

**AIRPORT INFRASTRUCTURE MANAGEMENT**

[illegible]

Activity Description	Orig Dur	Rem Dur	Early Start	Early Finish	Cal ID	RESP	2012					2013												2014																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
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# **EXHIBIT B**

## **PREVAILING WAGE RATE SCHEDULE**

**DIA Data Center**

**Contract Number 201310374**

**June 2013**

**DEPARTMENT OF AVIATION  
City & County of Denver**



**DENVER INTERNATIONAL AIRPORT**

**AIRPORT INFRASTRUCTURE MANAGEMENT**



**Career Service Authority**  
Denver's Human Resource Agency  
201 W. Colfax, Department 412  
Denver, CO 80202  
p: 720.913.5751  
f: 720.913.5720  
[www.denvergov.org/csa](http://www.denvergov.org/csa)

TO: All Users of the City of Denver Prevailing Wage Schedules  
FROM: Seth Duhon-Thornton Staff HR Professional  
DATE: Friday August 17, 2012  
SUBJECT: Latest Change to Prevailing Wage Schedules

Please be advised, prevailing wage rates for some building, heavy, and highway construction trades have not been updated by the United States Department of Labor (DOL) since March 1, 2002. The Career Service Authority Board, in their meeting held on April 21, 2011, approved the use of the attached supplemental wage rates until prevailing wage rates for these classifications of work are again published by the United States Department of Labor in accordance with the Davis-Bacon Act. The rates will be provided as a supplemental to the Davis-Bacon Highway rates issued by CSA.

The effective date for this publication is **Friday August 17, 2012** and applies to the City and County of Denver for **HIGHWAY CONSTRUCTION PROJECTS** in accordance with the Denver Revised Municipal Code, Section 20-76(c).

General Wage Decision No. CO120019  
Superseded General Decision No. CO20100021  
Modification No. 1  
Publication Date: 08/10/2012  
(8 pages)

Unless otherwise specified in this document, apprentices shall be permitted only if they are employed pursuant to, and individually registered in, a bona fide apprenticeship program registered with the U.S. Department of Labor (DOL). The employer and the individual apprentice must be registered in a program, which has received prior approval, by the DOL. Any employer, who employs an apprentice and is found to be in violation of this provision, shall be required to pay said apprentice the full journeyman scale.

For questions call (720) 913-5009

Attachments as listed above.



General Decision Number: CO120019 08/10/2012 CO19

Superseded General Decision Number: CO20100021

State: Colorado

Construction Type: Highway

Counties: Denver and Douglas Counties in Colorado.

#### HIGHWAY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/06/2012
1	08/10/2012

CARP9901-008 10/01/2010

	Rates	Fringes
CARPENTER (Form Work Only).....	\$ 24.00	11.28
-----		
ELEC0068-016 03/01/2011		

	Rates	Fringes
TRAFFIC SIGNALIZATION:		
Traffic Signal Installation		
Zone 1.....	\$ 26.42	4.75%+8.68
Zone 2.....	\$ 29.42	4.75%+8.68

#### TRAFFIC SIGNAL INSTALLER ZONE DEFINITIONS

Zone 1 shall be a 35 mile radius, measured from the following addresses in each of the following cities:  
Colorado Springs - Nevada & Bijou  
Denver - Ellsworth Avenue & Broadway  
Ft. Collins - Prospect & College  
Grand Junction - 12th & North Avenue  
Pueblo - I-25 & Highway 50  
All work outside of these areas shall be paid Zone 2 rates.

-----  
\* ENGI0009-008 06/25/2012

	Rates	Fringes
POWER EQUIPMENT OPERATOR:		
(3)-Hydraulic Backhoe (Wheel Mounted, under 3/4 yds), Hydraulic Backhoe (Backhoe/Loader combination), Drill Rig Caisson (smaller than Watson 2500 and similar), Loader (up to and including 6 cu. yd.).....	\$ 24.27	8.62
(3)-Loader (under 6 cu. yd.) Denver County.....	\$ 24.27	8.62
(3)-Motor Grader (blade- rough)		

Douglas County.....	\$ 24.27	8.62
(4)-Crane (50 tons and under), Scraper (single bowl, under 40 cu. yd).....	\$ 24.42	8.62
(4)-Loader (over 6 cu. yd) Denver County.....	\$ 24.42	8.62
(5)-Drill Rig Caisson (Watson 2500 similar or larger), Crane (51-90 tons), Scraper (40 cu.yd and over),.....	\$ 24.57	8.62
(5)-Motor Grader (blade-finish) Douglas County.....	\$ 24.57	8.62
(6)-Crane (91-140 tons).....	\$ 24.72	8.62

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SUCO2011-004 09/15/2011

	Rates	Fringes
CARPENTER (Excludes Form Work)...	\$ 19.27	5.08
CEMENT MASON/CONCRETE FINISHER		
Denver.....	\$ 20.18	5.75
Douglas.....	\$ 18.75	3.00
ELECTRICIAN (Excludes Traffic Signal Installation).....	\$ 35.13	6.83
FENCE ERECTOR (Excludes Link/Cyclone Fence Erection).....	\$ 13.02	3.20
GUARDRAIL INSTALLER.....	\$ 12.89	3.20
HIGHWAY/PARKING LOT STRIPING:Painter		
Denver.....	\$ 12.62	3.21
Douglas.....	\$ 13.89	3.21
IRONWORKER, REINFORCING (Excludes Guardrail Installation).....	\$ 16.69	5.45
IRONWORKER, STRUCTURAL (Includes Link/Cyclone Fence Erection, Excludes Guardrail Installation).....	\$ 18.22	6.01
LABORER		
Asphalt Raker.....	\$ 16.29	4.25
Asphalt Shoveler.....	\$ 21.21	4.25
Asphalt Spreader.....	\$ 18.58	4.65
Common or General		
Denver.....	\$ 16.76	6.77
Douglas.....	\$ 16.29	4.25
Concrete Saw (Hand Held)....	\$ 16.29	6.14
Landscape and Irrigation....	\$ 12.26	3.16
Mason Tender-Cement/Concrete		
Denver.....	\$ 16.96	4.04
Douglas.....	\$ 16.29	4.25



Pipelayer		
Denver.....	\$ 13.55	2.41
Douglas.....	\$ 16.30	2.18
Traffic Control (Flagger)...	\$ 9.55	3.05
Traffic Control (Sets Up/Moves Barrels, Cones, Install Signs, Arrow Boards and Place Stationary Flags) (Excludes Flaggers).....	\$ 12.43	3.22
PAINTER (Spray Only).....	\$ 16.99	2.87
POWER EQUIPMENT OPERATOR:		
Asphalt Laydown		
Denver.....	\$ 22.67	8.72
Douglas.....	\$ 23.67	8.47
Asphalt Paver		
Denver.....	\$ 24.97	6.13
Douglas.....	\$ 25.44	3.50
Asphalt Roller		
Denver.....	\$ 23.13	7.55
Douglas.....	\$ 23.63	6.43
Asphalt Spreader.....	\$ 22.67	8.72
Backhoe/Trackhoe		
Douglas.....	\$ 23.82	6.00
Bobcat/Skid Loader.....	\$ 15.37	4.28
Boom.....	\$ 22.67	8.72
Broom/Sweeper		
Denver.....	\$ 22.47	8.72
Douglas.....	\$ 22.96	8.22
Bulldozer.....	\$ 26.90	5.59
Concrete Pump.....	\$ 21.60	5.21
Drill		
Denver.....	\$ 20.48	4.71
Douglas.....	\$ 20.71	2.66
Forklift.....	\$ 15.91	4.68
Grader/Blade		
Denver.....	\$ 22.67	8.72
Guardrail/Post Driver.....	\$ 16.07	4.41
Loader (Front End)		
Douglas.....	\$ 21.67	8.22
Mechanic		
Denver.....	\$ 22.89	8.72
Douglas.....	\$ 23.88	8.22
Oiler		
Denver.....	\$ 23.73	8.41
Douglas.....	\$ 24.90	7.67
Roller/Compactor (Dirt and Grade Compaction)		
Denver.....	\$ 20.30	5.51
Douglas.....	\$ 22.78	4.86
Rotomill.....	\$ 16.22	4.41
Screed		
Denver.....	\$ 22.67	8.38
Douglas.....	\$ 29.99	1.40
Tractor.....	\$ 13.13	2.95
TRAFFIC SIGNALIZATION:		
Groundsman		
Denver.....	\$ 17.90	3.41

Douglas.....	\$ 18.67	7.17
TRUCK DRIVER		
Distributor		
Denver.....	\$ 17.81	5.82
Douglas.....	\$ 16.98	5.27
Dump Truck		
Denver.....	\$ 15.27	5.27
Douglas.....	\$ 16.39	5.27
Lowboy Truck.....	\$ 17.25	5.27
Mechanic.....	\$ 26.48	3.50
Multi-Purpose Specialty &		
Hoisting Truck		
Denver.....	\$ 17.49	3.17
Douglas.....	\$ 20.05	2.88
Pickup and Pilot Car		
Denver.....	\$ 14.24	3.77
Douglas.....	\$ 16.43	3.68
Semi/Trailer Truck.....	\$ 18.39	4.13
Truck Mounted Attenuator....	\$ 12.43	3.22
Water Truck		
Denver.....	\$ 26.27	5.27
Douglas.....	\$ 19.46	2.58

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WELDERS - Receive rate prescribed for craft performing  
operation to which welding is incidental.

**Career Service Authority****Supplemental to the Davis-Bacon *HIGHWAY* Construction Projects rates  
(Specific to the Denver Projects)  
(Supp 35, Date: 01-13-2012)**

<b><u>Classification</u></b>		<b><u>Base</u></b>	<b><u>Fringe</u></b>
Millwrights		\$28.00	\$10.00
Line Construction:			
	Lineman, Gas Fitter/Welder	\$36.88	\$9.55
	Line Eq Operator/Line Truck Crew	\$25.74	\$8.09
Power Equipment Operators (Tunnels Above and Below Ground, shafts and raises):			
	GROUP 1	\$25.12	\$10.81
	GROUP 2	\$25.47	\$10.85
	GROUP 3	\$25.57	\$10.86
	GROUP 4	\$25.82	\$10.88
	GROUP 5	\$25.97	\$10.90
	GROUP 6	\$26.12	\$10.91
	GROUP 7	\$26.37	\$10.94
Power Equipment Operators:			
	GROUP 1	\$22.97	\$10.60
	GROUP 2	\$23.32	\$10.63
	GROUP 3	\$23.67	\$10.67
	GROUP 4	\$23.82	\$10.68
	GROUP 5	\$23.97	\$10.70
	GROUP 6	\$24.12	\$10.71
	GROUP 7	\$24.88	\$10.79
Ironworkers (Ornamental)		\$24.80	\$10.03
Laborers (Removal of Asbestos)		\$21.03	\$8.55
Plumbers		\$30.19	\$13.55
Pipefitters		\$30.45	\$12.85
Truck Drivers:			
	GROUP 1	\$18.42	\$10.00
	GROUP 2	\$19.14	\$10.07
	GROUP 3	\$19.48	\$10.11
	GROUP 4	\$20.01	\$10.16
	GROUP 5	\$20.66	\$10.23
	GROUP 6	\$21.46	\$10.31

POWER EQUIPMENT OPERATOR CLASSIFICATIONS  
(TUNNELS ABOVE AND BELOW GROUND, SHAFTS, AND RAISES):

GROUP 1 - Brakeman

GROUP 2 - Motorman

GROUP 3 - Compressor

GROUP 4 - Air Tractors; Grout Machine; Gunnite Machine; Jumbo Form

GROUP 5 - Concrete Placement Pumps; Mucking Machines and Front End Loaders, Underground, Slusher; Mine Hoist Operator; Mechanic

GROUP 6 - Mechanic Welder

GROUP 7 - Mole

*NOTE: Any equipment listed below being used in tunnel work, below or above ground shall be paid not less than \$2.00 per hour above the listed wage rates.*

POWER EQUIPMENT OPERATOR CLASSIFICATIONS:

GROUP 1 - Air compressor, brakeman, drill operator -smaller than Watson 2500 and similar, operators of 5 or more light plants, welding machines, generators, single unit conveyor, pumps, vacuum well point system, tractor, under 70 hp with or without attachments compressors, 360 C.F.M. or less

GROUP 2 - Conveyor, handling building materials, ditch witch and similar trenching machine, forklift, haulage motor man, pugmill, portable screening plant with or without a spray bar, screening plants, with classifier, self-propelled roller, rubber-tires under 5 tons.

GROUP 3 - asphalt plant, backfiller; cableway signalman; C.M.I. and similar, concrete batching plants, concrete finish machine, concrete gang saw on concrete paving, concrete mixer, less than 1 yd., under 8 inches, distributors, bituminous surfaces dozer, drill, diamond or core, elevating graders, elevator operator, lubricating and service engineer, grout machine, gunnite machine, hoist, 1 drum, horizontal directional drill operator, hydraulic backhoes; road stabilization machine, sandblasting Machine, single unit portable crusher, with or without washer, Tie tamper, wheel mounted, trenching machine operator, winch on truck.

GROUP 4 - Cable operated power shovels, draglines, clamshells, 5 cubic yards and under, concrete mixer over 1 Cubic yard, concrete pavers 34E or similar, grade Checker, hoist, 2 drums, mechanic, mixer mobile, Portable crusher, with or without washer; tractor with sideboom, roto-M ill and similar, welder.

GROUP 5 - Cable operated power shovels, draglines, clamshells and Backhoes over 5 cubic yards, caisson drill Watson 2500 similar or larger, motor grader blade-finish, hoist 3 drum or more.

GROUP 6 - Cableway, derrick, quad nine push unit, wheel excavator, belt or elevating loader.

GROUP 7 - tower cranes all types.

TRUCK DRIVER CLASSIFICATIONS:

GROUP 1 - Greasemen, Servicemen and Ambulance Drivers, Battery Men, Shuttle Truck or Bus, Flat Rack Tandem Axle.

GROUP 2 - Fork Lift Driver, Straddle Truck Driver, Lumber Carrier, Liquid and Bulk Tankers Single Axle, Combination, Euclid Electric or Similar, Specialty and Hoisting, Truck Drivers Fuel Truck, Grease Truck, Combination Fuel and Grease.

GROUP 3 - Truck Driver Snow Plow, Truck Driver Dump or Type Jumbo and similar type equipment.

GROUP 4 - Cement Mixer Agitator Truck over 10 cubic yards to and including 15 cubic yards, Tire Man, Cab Operated Distributor Truck Driver.

GROUP 5 - Heavy Duty Diesel Mechanic, Body Man, Welders or Combination Men.

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.



**Career Service Authority**  
Denver's Human Resource Agency  
201 W. Colfax, Department 412  
Denver, CO 80202  
p: 720.913.5751  
f: 720.913.5720  
[www.denvergov.org/csa](http://www.denvergov.org/csa)

TO: All Users of the City of Denver Prevailing Wage Schedules  
FROM: Seth Duhon-Thornton, Staff Human Resource Professional  
DATE: Friday September 7, 2012  
SUBJECT: Latest Change to Prevailing Wage Schedules

Please be advised, prevailing wage rates for some building, heavy, and highway construction trades have not been updated by the United States Department of Labor (DOL) since March 1, 2002. The Career Service Authority Board, in their meeting held on April 21, 2011, approved the use of the attached supplemental wage rates until prevailing wage rates for these classifications of work are again published by the United States Department of Labor in accordance with the Davis-Bacon Act. The rates will be provided as a supplemental to the Davis-Bacon Heavy rates issued by CSA.

The effective date for this publication will be **Friday September 7, 2012** and applies to the City and County of Denver for **HEAVY CONSTRUCTION PROJECTS** in accordance with the Denver Revised Municipal Code, Section 20-76(c).

General Wage Decision No. CO120012  
Superseded General Decision No. CO20100012  
Modification No. 9  
Publication Date: 08/31/2012  
(8 pages)

Unless otherwise specified in this document, apprentices shall be permitted only if they are employed pursuant to, and individually registered in, a bona fide apprenticeship program registered with the U.S. Department of Labor (DOL). The employer and the individual apprentice must be registered in a program, which has received prior approval, by the DOL. Any employer, who employs an apprentice and is found to be in violation of this provision, shall be required to pay said apprentice the full journeyman scale.

For questions please call (720) 913-5018

Attachments as listed above.

General Decision Number: CO120012 08/31/2012 CO12

Superseded General Decision Number: CO20100012

State: Colorado

Construction Type: Heavy

Counties: Adams, Arapahoe, Boulder, Broomfield, Denver,  
Douglas, El Paso, Jefferson, Larimer, Mesa, Pueblo and Weld  
Counties in Colorado.

#### HEAVY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/06/2012
1	01/13/2012
2	01/27/2012
3	04/20/2012
4	06/01/2012
5	07/20/2012
6	07/27/2012
7	08/10/2012
8	08/17/2012
9	08/31/2012

ASBE0028-001 07/01/2010

	Rates	Fringes
Asbestos Workers/Insulator (Includes application of all insulating materials, protective coverings, coatings and finishings to all types of mechanical systems).....	\$ 30.23	11.53

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BRCO0007-004 01/01/2011

ADAMS, ARAPAHOE, BOULDER, BROOMFIELD, DENVER, DOUGLAS AND  
JEFFERSON COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 22.13	9.89

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BRCO0007-006 06/01/2011

EL PASO AND PUEBLO COUNTIES

	Rates	Fringes
BRICKLAYER.....	\$ 21.97	9.88

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ELEC0012-004 09/01/2011

PUEBLO COUNTY

	Rates	Fringes
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## ELECTRICIAN

Electrical work where the cost is \$150,000 or less....\$ 24.25	11.83
Electrical work where the cost is over \$150,000.....\$ 26.75	11.90

-----  
ELEC0068-001 06/01/2011ADAMS, ARAPAHOE, BOULDER, BROOMFIELD, DENVER, DOUGLAS,  
JEFFERSON, LARIMER, AND WELD COUNTIES

	Rates	Fringes
ELECTRICIAN.....	\$ 31.60	12.57

-----  
ELEC0111-001 09/01/2011

	Rates	Fringes
Line Construction:		
Cable Splicer.....	\$ 28.65	13.75%+4.75
Equipment Operator-		
Underground.....	\$ 25.06	12.75%+4.75
Groundman.....	\$ 21.93	9.55
Line Equipment Operator.....	\$ 26.77	10.55
Lineman and Welder.....	\$ 38.36	14.11

-----  
ELEC0113-002 06/01/2012

EL PASO COUNTY

	Rates	Fringes
ELECTRICIAN.....	\$ 29.05	14.47

-----  
ELEC0969-002 06/01/2010

MESA COUNTY

	Rates	Fringes
ELECTRICIAN.....	\$ 20.75	5.66

-----  
ENGI0009-001 06/25/2012

	Rates	Fringes
Power equipment operators:		
Blade: Finish.....	\$ 24.57	8.62
Blade: Rough.....	\$ 24.27	8.62
Bulldozer.....	\$ 24.27	8.62
Cranes: 50 tons and under..	\$ 24.42	8.62
Cranes: 51 to 90 tons.....	\$ 24.57	8.62
Cranes: 91 to 140 tons.....	\$ 24.72	8.62
Cranes: 141 tons and over...	\$ 25.48	8.62
Forklift.....	\$ 23.92	8.62
Mechanic.....	\$ 24.42	8.62
Oiler.....	\$ 23.57	8.62
Scraper: Single bowl		
under 40 cubic yards.....	\$ 24.42	8.62
Scraper: Single bowl,		
including pups 40 cubic		



yards and over and tandem		
bowls.....	\$ 24.57	8.62
Trackhoe.....	\$ 24.42	8.62

-----  
IRON0024-003 07/01/2011

	Rates	Fringes
Ironworkers:.....	\$ 23.80	18.07
Structural		

-----  
LABO0086-001 05/01/2009

	Rates	Fringes
Laborers:		
Pipelayer.....	\$ 18.68	6.78

-----  
PLUM0003-005 07/01/2012

ADAMS, ARAPAHOE, BOULDER, BROOMFIELD, DENVER, DOUGLAS,  
JEFFERSON, LARIMER AND WELD COUNTIES

	Rates	Fringes
PLUMBER.....	\$ 33.43	11.44

-----  
PLUM0058-002 07/01/2012

EL PASO COUNTY

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 32.55	12.95

-----  
PLUM0058-008 07/01/2012

PUEBLO COUNTY

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 32.55	12.95

-----  
PLUM0145-002 07/01/2011

MESA COUNTY

	Rates	Fringes
Plumbers and Pipefitters.....	\$ 35.17	11.05

-----  
\* PLUM0208-004 07/12/2012

ADAMS, ARAPAHOE, BOULDER, BROOMFIELD, DENVER, DOUGLAS,  
JEFFERSON, LARIMER AND WELD COUNTIES

	Rates	Fringes
PIPEFITTER.....	\$ 30.10	11.52

-----  
SHEE0009-002 01/01/2011

	Rates	Fringes
Sheet metal worker.....	\$ 31.66	10.98
-----		
SUCO2001-006 12/20/2001		

	Rates	Fringes
BOILERMAKER.....	\$ 17.60	
Carpenters:		
Form Building and Setting...	\$ 16.97	2.74
All Other Work.....	\$ 15.14	3.37
Cement Mason/Concrete Finisher...	\$ 17.31	2.85
IRONWORKER, REINFORCING.....	\$ 18.83	3.90
Laborers:		
Common.....	\$ 11.22	2.92
Flagger.....	\$ 8.91	3.80
Landscape.....	\$ 12.56	3.21
Painters:		
Brush, Roller & Spray.....	\$ 15.81	3.26
Power equipment operators:		
Backhoe.....	\$ 16.36	2.48
Front End Loader.....	\$ 17.24	3.23
Skid Loader.....	\$ 15.37	4.41
-----		

TEAM0455-002 07/01/2011

	Rates	Fringes
Truck drivers:		
Pickup.....	\$ 18.41	3.87
Tandem/Semi and Water.....	\$ 19.04	3.87
-----		

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

**Career Service Authority**  
**Supplemental to the Davis-Bacon *HEAVY* Construction Projects rates**  
**(Specific to the Denver Projects)**  
**(Supp #74, Date: 02-03-2012)**

<b><u>Classification</u></b>		<b><u>Base</u></b>	<b><u>Fringe</u></b>
Millwrights		\$28.00	\$10.00
Line Construction:			
	Lineman, Gas Fitter/Welder	\$36.88	\$9.55
	Line Eq Operator/Line Truck Crew	\$25.74	\$8.09
Power Equipment Operators (Tunnels Above and Below Ground, shafts and raises):			
	GROUP 1	\$25.12	\$10.81
	GROUP 2	\$25.47	\$10.85
	GROUP 3	\$25.57	\$10.86
	GROUP 4	\$25.82	\$10.88
	GROUP 5	\$25.97	\$10.90
	GROUP 6	\$26.12	\$10.91
	GROUP 7	\$26.37	\$10.94
Power Equipment Operators:			
	GROUP 1	\$22.97	\$10.60
	GROUP 2	\$23.32	\$10.63
	GROUP 3	\$23.67	\$10.67
	GROUP 4	\$23.82	\$10.68
	GROUP 5	\$23.97	\$10.70
	GROUP 6	\$24.12	\$10.71
	GROUP 7	\$24.88	\$10.79
Ironworkers (Ornamental)		\$24.80	\$10.03
Laborers:			
	GROUP 1	\$17.68	\$8.22
	GROUP 2	\$18.18	\$8.27
	GROUP 3	\$21.59	\$8.61
Laborers: (Tunnel)			
	GROUP 1	\$18.53	\$8.30
	GROUP 2	\$18.63	\$8.31
	GROUP 3	\$19.73	\$8.42
	GROUP 4	\$21.59	\$8.61
	GROUP 5	\$19.68	\$8.42
Laborers (Removal of Asbestos)		\$21.03	\$8.55
Truck Drivers:			
	GROUP 1	\$18.42	\$10.00
	GROUP 2	\$19.14	\$10.07
	GROUP 3	\$19.48	\$10.11
	GROUP 4	\$20.01	\$10.16
	GROUP 5	\$20.66	\$10.23
	GROUP 6	\$21.46	\$10.31

POWER EQUIPMENT OPERATOR CLASSIFICATIONS  
(TUNNELS ABOVE AND BELOW GROUND, SHAFTS, AND RAISES):

GROUP 1 - Brakeman  
GROUP 2 - Motorman  
GROUP 3 - Compressor  
GROUP 4 - Air Tractors; Grout Machine; Gunnite Machine; Jumbo Form  
GROUP 5 - Concrete Placement Pumps; Mucking Machines and Front End Loaders, Underground, Slusher; Mine Hoist Operator; Mechanic  
GROUP 6 - Mechanic Welder  
GROUP 7 - Mole

*NOTE: Any equipment listed below being used in tunnel work, below or above ground shall be paid not less than \$2.00 per hour above the listed wage rates.*

POWER EQUIPMENT OPERATOR CLASSIFICATIONS:

GROUP 1 - Air compressor, brakeman, drill operator - smaller than Watson 2500 and similar, operators of 5 or more light plants, welding machines, generators, single unit conveyor, pumps, vacuum well point system, tractor, under 70 hp with or without attachments compressors, 360 C.F.M. or less.

GROUP 2 - Conveyor, handling **building** materials, ditch witch and similar trenching machine, haulage motor man, pugmill, portable screening plant with or without a spray bar, screening plants, with classifier.

GROUP 3 - Asphalt screed, asphalt plant, backfiller, bituminous spreader or laydown machine; cableway signalman, caisson drill, William MF, similar or larger; C.M.I. and similar, concrete batching plants, concrete finish machine, concrete gang saw on concrete paving, concrete mixer, less than 1 yd., concrete placement pumps, under 8 inches, distributors, bituminous surfaces dozer, drill, diamond or core, drill rigs, rotary, churn, or cable tool, elevating graders, elevator operator, equipment, lubricating and service engineer, grout machine, gunnite machine, hoist, 1 drum, horizontal directional drill operator, sandblasting machine, single unit portable crusher, with or without washer, tie tamper, wheel mounted, tractor, 70 hp and over with or without attachments, trenching machine operator, winch on truck.

GROUP 4 - Cable operated power shovels, draglines, clamshells, and backhoes, 5 cubic yards and under, concrete mixer over 1 cubic yard, concrete paver 34E or similar, concrete placement pumps, 8 inches and over, grade checker, hoist, 2 drums, hydraulic backhoe, 3/4 yds and over, loader, over 6 cubic yards, mechanic, mixer mobile, multiple unit portable crusher, with or without washer; piledriver, tractor with sideboom, roto- mill and similar, welder.

GROUP 5 - Cable operated power shovels, draglines, clamshells and backhoes over 5 cubic yards, caisson drill Watson 2500 similar or larger, hoist 3 drum or more, mechanic – welder (heavy-duty).

GROUP 6 - Cableway, derrick, quad nine push unit, wheel excavator, belt or elevating loader

GROUP 7 - tower cranes all types

LABORER CLASSIFICATIONS:

GROUP 1 - Janitors; Yardmen

GROUP 2 - including caissons to 8' carrying Reinforcing Rods; Dowel Bars; Fence Erectors; Fire Watchers on power plants and oilrefineries; Gabion Basket and Reno mattresses; Signaling, Metal Mesh; pipe plants and yards; Shrubs and flowers; Stake Caser; Traffic Control Devices; Tie Bars and Chairs in Concrete; Paving; Waterproofing Concrete; Air, Gas, Hydraulic Tools and Electrical Tool Operators; Barco Hammers; Cutting Torches; drill; diamond and core drills; Core, diamond, air track including but not limited to; Joy, Mustang, PR-143, 220 Gardner-**Denver**, Hydrosonic, and water blaster operator; Chuck Tender; Electric hammers; Jackhammers; Hydraulic Jacks; Tampers; Air Tampers; Boring Machines; Air Hydraulic Boring machines; Automatic Concrete Power Curbing

Machines; Concrete Processing Material; form setters; Highways, Streets, and Airports runways; Operators of concrete saws on pavement (other than gangsaws); Power operated Concrete Buggies; Hot Asphalt Labor; Asphalt Curb Machines; Paving Breakers; Transverse Concrete Conveyor Operator; Cofferdams; Boxtenders; Caisson 8' to 12'; Caisson Over 12'; Jackhammer Operators in Caissons over 12'; Labor applicable to Pipe coating or Wrapping; Pipe Wrappers, Plant and Yard; Relining Pipe; Hydroliner (a plastic may be used to waterproof); Pipelayer on Underground Bores; Sewer, Water, Gas, Oil and Telephone Conduit; Enamalers on Pipe, inside and out, Mechanical Grouters; Monitors; Jeep Holiday Detector Men; Pump Operators; Rakers; Vibrators; Hydro- broom, Mixer Man; Gunnite Nozzlemen; Shotcrete Operator; and chain saws, gas and electric; Sand Blaster; Licensed Powdermen; Powdermen and Blaster; Siphons; Signalmen; Dumpman/spotter; Grade Checker.

GROUP 3 - Plug and galleys in dams; Scalars; any work on or off Bridges 40' above the ground performed by Laborers working from a Bos'n Chair, Swing Stage, Life Belt, or Block and Tackle as a safety requirement.

#### TUNNEL LABORER CLASSIFICATIONS:

GROUP 1 - Outside Laborer - Above ground

GROUP 2 - Minimum Tunnel Laborer, Dry Houseman

GROUP 3 - Cable or Hose Tenders, Chuck Tenders, Concrete Laborers, Dumpmen, Whirley Pump Operators

GROUP 4 - Tenders on Shotcrete, Gunniting and Sand Blasting; Tenders, core and Diamond Drills; Pot Tenders

GROUP 5 - Collapsible Form Movers and Setters; Miners; Machine Men and Bit Grinders; Nippers; Powdermen and Blasters; Reinforcing Steel Setters; Timbermen (steel or wood tunnel support, including the placement of sheeting when required); and all Cutting and Welding that is incidental to the Miner's work; Tunnel Liner Plate Setters; Vibrator Men, Internal and External; Unloading, stopping and starting of Moran Agitator Cars; Diamond and Core Drill Operators; Shotcrete operator; Gunnite Nozzlemen; Sand Blaster; Pump Concrete Placement Men.

#### TRUCK DRIVER CLASSIFICATIONS:

GROUP 1 - Sweeper Truck, Flat Rack Single Axle and Manhaul, Shuttle Truck or Bus.

GROUP 2 - Dump Truck Driver to and including 6 cubic yards, Dump Truck Driver over 6 cubic yards to and including 14 cubic yards, Straddle Truck Driver, Liquid and Bulk Tankers Single Axle, Euclid Electric or Similar, Multipurpose Truck Specialty and Hoisting.

GROUP 3 - Truck Driver Snow Plow.

GROUP 4 - Cement Mixer Agitator Truck over 10 cubic yards to and including 15 cubic yards.

WELDERS: Receive rate prescribed for craft performing operation to which welding is incidental.

# **EXHIBIT C**

## **NEGOTIATED FIXED CONTRACT PRICE**

**DIA Data Center**

**Contract Number 201310374**

**June 2013**

**DEPARTMENT OF AVIATION  
City & County of Denver**



**DENVER INTERNATIONAL AIRPORT**

**AIRPORT INFRASTRUCTURE MANAGEMENT**

## DIA Data Center

### Exhibit C - Lump Sum - Schedule of Prices & Quantities

Company Name: **PCL Construction Services Inc.**  
 Contract Name: **DIA Data Center**  
 Contract Number: **201310374**

Design Segment Pricing: \$ 551,154.00  
 Construction Segment Pricing: \$ 8,889,210.00  
**Total Project Cost: \$ 9,440,364.00**

Data entry is allowed in yellow cells only.

Segment	Unit Price	Quantity	Base Scope Price	Segment Pricing
<b>DESIGN SEGMENT PRICING:</b>				
<b>Site Development:</b>				
<i>(Including any Site Constructed Buildings and Structures)</i>				
1	Site Survey	\$ 9,885.00	1	9,885.00
2	Geotechnical Engineering	6,528.00	1	6,528.00
3	Civil Engineering	58,956.00	1	58,956.00
4	Architectural Design		1	-
5	LEED and Sustainability Design	28,883.00	1	28,883.00
6	Structural Engineering	28,072.00	1	28,072.00
7	Mechanical Engineering		1	-
8	Plumbing Engineering	4,598.00	1	4,598.00
9	Fire Protection and Life Safety	6,819.00	1	6,819.00
10	Electrical Engineering	36,975.00	1	36,975.00
11	Cathodic Protection		1	-
12	Communications and Data Systems Engineering		1	-
13	Lightning Protection		1	-
14	Signage		1	-
15	Security Systems Engineering (Access Control, CCTV, etc.)	3,669.00	1	3,669.00
16	Other (Provide a detailed explanation)		1	-
<b>Total Site Development Segment</b>				<b>\$ 184,385.00</b>
<b>Modular Data Center Development:</b>				
17	Modular Building Components - Planning	56,203.00	1	56,203.00
18	Modular Building Components - Design	62,891.00	1	62,891.00
19	Modular Building Components - Coordination	88,201.00	1	88,201.00
20	Other (Provide a detailed explanation)		1	-
<b>Total Modular Data Center Development</b>				<b>\$ 207,295.00</b>
<b>Preconstruction Management:</b>				
21	Design Management	109,447.00	1	109,447.00
22	BIM Management	11,273.00	1	11,273.00
23	Cost Estimating Management	3,029.00	1	3,029.00
24	Scheduling Management	19,763.00	1	19,763.00
25	Modular Building Procurement Management	8,667.00	1	8,667.00
26	LEED and Sustainability Management	7,295.00	1	7,295.00
27	Other (Provide a detailed explanation)		1	-
<b>Total Preconstruction Management</b>				<b>\$ 159,474.00</b>
<b>TOTAL DESIGN SEGMENT PRICING</b>				<b>\$ 551,154.00</b>
<b>CONSTRUCTION SEGMENT PRICING:</b>				
<b>Site Development:</b>				
<b>Site Preparation:</b>				
<i>(Including any Site Constructed Buildings and Structures)</i>				
28	Erosion Control, Soil Excavation, Soil Back Fill, Site Grading, Drainage,	\$ 70,642.00	1	70,642.00
<b>Site Work:</b>				
29	Perimeter Security Fencing & Entrance	154,900.00	1	154,900.00
30	Site Security (CCTV, Access Control, etc.)	7,257.00	1	7,257.00
31	Building Protection (Berms, Mass Walls, Bollards, etc.)		1	-
32	Roadway (Paving, Curb & Gutter, Lighting, etc.)	14,096.00	1	14,096.00
33	Parking (Paving, Lighting, etc.)		1	-
34	Utilities (Domestic Water, Fire Line, Fire Hydrant, meters, Storm Water,	238,620.00	1	238,620.00
35	Landscaping	12,501.00	1	12,501.00
<b>Concrete Work:</b>				
36	Foundation, Generator Pads, Sidewalk, Light Pole Bases, etc.	441,990.00	1	441,990.00
37	<b>Site Constructed Buildings and Structures</b>			-
	(Provide a Detailed Breakdown that includes the Major Trades)		1	-
38	<b>Other</b> (Testing and surveying):	41,259.00	1	41,259.00
<b>Total Site Development</b>				<b>\$ 981,265.00</b>
<b>Modular Data Center Development:</b>				
<b>Modular Building Components:</b>				
39	Data / Server Room Module(s)	1,365,976.00	1	1,365,976.00
40	Ancillary Space Module(s)	436,353.00	1	436,353.00
41	Support Module(s)		1	-
42	Power Module(s)	2,267,463.00	1	2,267,463.00

## DIA Data Center

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 Contract Number: **201310374**

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 Construction Segment Pricing: \$ 8,889,210.00  
**Total Project Cost: \$ 9,440,364.00**

Data entry is allowed in yellow cells only.

	Segment	Unit Price	Quantity	Base Scope Price	Segment Pricing
43	Cooling Module(s)		1	-	
44	Generator(s)	458,799.00	1	458,799.00	
45	IT Racks	755,790.00	1	755,790.00	
46	Other (Provide a detailed explanation)	1,005,001.00	1	1,005,001.00	
	<u>Modular Building Components Delivery, Installation, and Site Assembling:</u>			-	
47	Data / Server Room Module(s)	181,691.00	1	181,691.00	
48	Ancillary Space Module(s)	41,995.00	1	41,995.00	
49	Support Module(s)		1	-	
50	Power Module(s)	102,682.00	1	102,682.00	
51	Cooling Module(s)	159,379.00	1	159,379.00	
52	Generator(s)		1	-	
53	IT Racks		1	-	
54	Utilities Tie In and Connections	304,992.00	1	304,992.00	
55	Other (Provide a detailed explanation)		1	-	
	<b>Total Modular Data Center Development</b>				<b>\$ 7,080,121.00</b>
	<u>Construction Management:</u>				
56	DCIM/BMS	10,450.00	1	10,450.00	
57	Cost Estimating Management	1,515.00	1	1,515.00	
58	Scheduling Management	1,515.00	1	1,515.00	
59	BIM Management	758.00	1	758.00	
60	Modular Building Procurement Management	8,741.00	1	8,741.00	
61	Construction Management		1	-	
62	Commissioning Management	15,420.00	1	15,420.00	
63	LEED and Sustainability Management	83,693.00	1	83,693.00	
64	General Requirements	651,732.00	1	651,732.00	
65	Other (Contractor controlled contingency)	54,000.00	1	54,000.00	
	<b>Total Construction Management</b>				<b>\$ 827,824.00</b>
	<b>TOTAL CONSTRUCTION SEGMENT PRICING</b>				<b>\$ 8,889,210.00</b>
	<b><u>TOTAL PROJECT PRICING</u></b>				<b><u>\$ 9,440,364.00</u></b>





**CONSTRUCTION LEADERS**

### **SUMMARY**

<input checked="" type="checkbox"/> <b>Original Base Price (per the proposal date October 31, 2012)</b>	<b>\$9,180,232</b>
<u>Base Proposal and Price Revised Items</u>	
<input checked="" type="checkbox"/> Hard pipe sewage line(s) to CCD sanitary sewer system	<b>\$143,677</b>
<input checked="" type="checkbox"/> Cage with card access for each rack row	<b>\$45,612</b>
<input checked="" type="checkbox"/> Starline electrical track busway system	<b>\$235,127</b>
<input checked="" type="checkbox"/> Re-configure Eaton racks and Raritan PDUs (due to Starline)	<b>(\$42,269)</b>
<input checked="" type="checkbox"/> Rollup overhead door at receiving dock and revise driveway configuration	<b>N/C</b>
<input checked="" type="checkbox"/> Provide dissipative non-static carpet	<b>N/C</b>
<input checked="" type="checkbox"/> Provide energy efficient LED light system	<b>N/C</b>
<input checked="" type="checkbox"/> Critical alarming for heat pipe cooling	<b>N/C</b>
<input checked="" type="checkbox"/> Temporary heat	<b>\$5,100</b>
<input checked="" type="checkbox"/> Material and Commodity price increases since October 2012	<b>\$73,395</b>
<hr/>	
<input checked="" type="checkbox"/> <b>Revised Base Price (February 12, 2013)</b>	<b>\$9,640,874</b>



## CONSTRUCTION LEADERS

### Accepted Cost Saving Alternates

<input checked="" type="checkbox"/> Delete ballistic shielding testing agency certification requirements	(\$49,510)
<input checked="" type="checkbox"/> Delete ballistic shielding specification from roof	(\$154,720)
<input checked="" type="checkbox"/> Delete ballistic shielding specification from all walls	(\$117,590)
<input checked="" type="checkbox"/> Decrease UPS battery runtime from 12 minutes to 6 minutes (Including credit for power module size reduction)	(\$86,600)
<input checked="" type="checkbox"/> Reduce short circuit rating from 100k aic to 65k aic <b>(Previously included in \$9,640,874 proposal)</b>	
<input checked="" type="checkbox"/> Delete spare circuit breaker (space for spare to remain) <b>(Previously included in \$9,640,874 proposal)</b>	
<input checked="" type="checkbox"/> Reduce the number of distribution breakers at main switchgears and distribution switchboards <b>(Previously included in \$9,640,874 proposal)</b>	
<input checked="" type="checkbox"/> Replace distribution switchboards with draw out main breakers with distribution switchboards with thermal magnetic breakers <b>(Previously included in \$9,640,874 proposal)</b>	
<input checked="" type="checkbox"/> Attach electrical modules to the data center modules to eliminate the concrete encased underground conduits and space generators closer together to reduce the feeder lengths to the paralleling switchgear	
Structural slab and foundations	(\$10,500)
Module unloading and assembly	\$6,400
Electrical to additional modules	\$3,100
Electrical reductions due to site and layout	(\$17,900)
	<b>(\$18,900)</b>
<input checked="" type="checkbox"/> Provide single feed and transfer switch for AHU1/AHU1 supply <b>(Previously included in \$9,640,874 proposal)</b>	
<input checked="" type="checkbox"/> Provide single feed and transfer switch for AHU2/AHU2 supply <b>(Previously included in \$9,640,874 proposal)</b>	
<input checked="" type="checkbox"/> Reduce width of Data Center Modules from 12.5 feet to 10.5 feet	(\$4,600)
<input checked="" type="checkbox"/> Provide exterior ductwork section at southernmost AHU since the 10.5 ' IT modules previously requested will not be provided at this time. (Please refer to Separate Price for IT Modules noted below.)	\$11,700
<input checked="" type="checkbox"/> Additional reduction for owner controlled insurance program.	(\$5,200)
<input checked="" type="checkbox"/> Provide all works as required to support / construct for the proper operations of the (2) additional 10.5' Data Center Modules including the site works, foundation, structural slab, utilities, heating and cooling, all electrical works, Design-Build Contractor general conditions, but excluding IT modules, equipment racks, Starline and cage with card access (Please refer to Separate Price for IT Modules noted below.) <b>(Included in the \$18,900 credit.)</b>	
<input checked="" type="checkbox"/> Add foundations (now) for future power modules and future genset. This cost also includes the construction of an empty U/G ductbank between the future generator and future power modules. (Concrete pads for future transformers and related U/G electrical infrastructure to and from the future transformers are excluded.)	\$58,710
<input checked="" type="checkbox"/> Provide K8 perimeter security fence and gate (per Exhibit A)	\$166,200
<b>Final Contract Amount</b>	<b>\$9,440,364</b>



**CONSTRUCTION LEADERS**

**Separate Prices**

1. Provide (2) additional 10.5 feet wide complete Data Center Modules  
**(If ordered before September 1, 2013)** **\$324,900**
2. Provide (2) additional 10.5 feet wide complete Data Center Modules  
**(If ordered between September 1, 2013 and February 1, 2014)** **\*\$421,300**
3. Provide (2) additional 10.5 feet wide complete Data Center Modules  
**(If ordered after February 1, 2014)** **\*\$487,300**

\* Please note that these prices are strictly for the supply cost only of the IT modules and do not include costs related to additional overhead costs resulting from an extension to the schedule and re-mobilization. These costs cannot be confirmed until the actual date of order is established and the schedule impact is determined.

**Rejected Cost Saving Alternates**

- |   |                    |
|---|--------------------|
| <input checked="" type="checkbox"/> Delete ballistic shielding specification from walls - partial | <b>(\$36,116)</b>  |
| <input checked="" type="checkbox"/> Replace paralleling switchgear with ATS                       | <b>(\$130,000)</b> |
| <input checked="" type="checkbox"/> Replace Prime-rated generators with Standby-rated generators  | <b>(\$1,400)</b>   |
| <input checked="" type="checkbox"/> Cage with card reader for above new IT modules                | <b>\$11,400</b>    |

# **EXHIBIT D**

## **NOTICE TO PROCEED**

**DIA Data Center**

**Contract Number 201310374**

**June 2013**

**DEPARTMENT OF AVIATION**  
**City & County of Denver**



**AIRPORT INFRASTRUCTURE MANAGEMENT**

**CITY AND COUNTY OF DENVER**

**DEPARTMENT OF AVIATION**

\*\*\*\*\*

**NOTICE TO PROCEED**

Date:

TO: [Proposer name and address]

You are hereby authorized and directed to proceed on this date with the work of constructing (Contract No.), DIA Data Center, Denver International Airport, Denver, Colorado, as set forth in detail in the Contract Documents for the City and County of Denver.

CITY AND COUNTY OF DENVER

By\_\_\_\_\_

\_\_\_\_\_  
Deputy Manager of Aviation,  
Planning & Development

By\_\_\_\_\_

\_\_\_\_\_  
Manager of Aviation

**EXHIBIT E**

**GENERAL CONTRACT CONDITIONS**  
(Table of Contents Attached)

DIA Data Center

Contract Number 201310374

June 2013

**DEPARTMENT OF AVIATION**  
**City & County of Denver**



**DENVER INTERNATIONAL AIRPORT**

AIRPORT INFRASTRUCTURE MANAGEMENT

**CITY AND COUNTY OF DENVER**  
**DEPARTMENT OF AVIATION**  
**DEPARTMENT OF PUBLIC WORKS**  
**STANDARD SPECIFICATIONS FOR CONSTRUCTION**  
**CONSTRUCTION CONTRACT GENERAL CONDITIONS**  
**2011 Edition**

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**EXHIBIT F**

**SPECIAL CONTRACT  
CONDITIONS**

DIA Data Center

Contract Number 201310374

June 2013

**DEPARTMENT OF AVIATION**  
**City & County of Denver**



**DENVER INTERNATIONAL AIRPORT**

**AIRPORT INFRASTRUCTURE MANAGEMENT**

**SPECIAL CONTRACT CONDITIONS**  
**Contract No: 201310374**  
**DIA Data Center**

**SC-1 CONSTRUCTION CONTRACT GENERAL CONDITIONS**

The Construction Contract General Conditions which constitute a part of the Contract Documents are set forth in a separately published document, entitled “City and County of Denver, Department of Aviation and Department of Public Works, Standard Specifications for Construction, General Contract Conditions,” 2011 Edition, the Table of Contents to which is bound herein (which may be informally referred to as the Yellow Book). The General Conditions book is available for purchase for \$12.00 per copy at the following locations during the business hours stated, Monday through Friday, excluding holidays:

Office of the Cashier  
Wellington E. Webb Municipal Office  
Building, 2nd Floor  
201 West Colfax Avenue  
Denver, Colorado, USA 80202  
7:30 a.m. to 4:30 p.m.

The General Conditions are also available on the DIA Contract Procurement on the City and County of Denver website at:

[http://www.denvergov.org/dpw\\_contract\\_admin/ContractAdministration/ContractorReferenceDocuments/tabid/440535/Default.aspx](http://www.denvergov.org/dpw_contract_admin/ContractAdministration/ContractorReferenceDocuments/tabid/440535/Default.aspx)

**SC-2 DRAWINGS AND SPECIFICATIONS TO BE FURNISHED BY THE CITY**

Delete General Condition 403.1.

**SC-3 REVISIONS TO G.C. 201**

The second sentence of General Condition 201 is amended to read: “The unit responsible for this management and control is the Planning & Development Office under the supervision of the Deputy Manager of Aviation for Maintenance and Planning & Development.”

**SC-4 CITY LINE OF AUTHORITY AND CONTACTS**

In accordance with General Condition 212, the City’s line of authority for administration of this Contract is:

Manager of Aviation (the “Manager” under G.C. 112). The Manager of Aviation is Kim Day, Executive Office, 9<sup>th</sup> Floor, Airport Office Building, 8500 Peña Boulevard, Denver, CO 80249.

Deputy Manager of Aviation for Airport Infrastructure Management (the “Deputy Manager” under G.C. 109), who reports to the Manager. The Manager is Dave LaPorte, Airport

Infrastructure Management (AIM), 9th Floor, Airport Office Building, 8500 Peña Boulevard, Denver, CO 80249.

Assistant Manager of Aviation for Airport Infrastructure Management (AIM) (the “Assistant Manager”), reports to the Deputy Manager. The Project Manager reports to the Assistant Manager. The Assistant Manager is Reginald Norman, Airport Infrastructure Management (AIM), 7<sup>th</sup> Floor, Airport Office Building, 8500 Peña Boulevard, Denver, CO 80249.

Project Manager, the City representative who has day to day administrative responsibility of this Contract, and who reports to the Deputy Manager. All notices, requests, pay applications (pursuant to G.C. 902), and other correspondence from the Contractor shall be sent to the assigned Project Manager unless otherwise provided in this Contract. The Project Manager for this Contract is: Paul Sun, Airport Infrastructure Management (AIM), 7<sup>th</sup> Floor, Airport Office Building, 8500 Peña Boulevard, Denver, CO 80249.

The Manager may from time to time substitute a different City official as the designated “Deputy Manager” hereunder, and any such change will be effective upon the issuance of written notice to the Contractor which identifies the successor Deputy Manager. The Deputy Manager may from time to time change the assigned Project Manager, and any such change will be effective upon the issuance of written notice to the Contractor which identifies the successor Project Manager.

#### **SC-5 NOT USED**

#### **SC-6 COOPERATION WITH OTHERS**

The Technical Specifications describe the constraints on the physical work site areas. These descriptions are not exhaustive and the Contractor is required to coordinate its activities and work as may be required to meet FAA or City requirements while performing work on DIA.

Without limiting the foregoing, the following contracts administered by the City involve or may involve work overlapping or adjoining the Work under this Contract, and may be prosecuted concurrently with the Work performed under this Contract. There may also be other adjoining or overlapping contracts which are not listed.

<u>Contract No.</u>	<u>Description</u>
<u>None at this time</u>	

## **SC-7 PROSECUTION AND COMPLETION OF THE WORK:**

The Work to be performed under the Contract is described in the Technical Specifications and Contract Drawings. The Contractor shall substantially complete the Work within two hundred and seventy five (275) consecutive calendar days from Notice to Proceed.

## **SC-8 LIQUIDATED DAMAGES**

If the Contractor fails to achieve Substantial Completion of the Work within the Contract Time, the Contractor shall be liable to the City for liquidated damages at the rate of \$1,000 per calendar day until substantial completion is achieved.

Section 7.3 of the Contract and General Condition 602 cover payment and withholding of liquidated damages.

## **SC-9 FACILITY SECURITY AND PERSONNEL ACCESS**

The Contractor shall conduct all its activities at the Airport in compliance with the Airport security system rules and regulations, which are administered by the Airport Operations Division. The Contractor shall obtain the proper access authorizations for its employees, subcontractors and suppliers (i.e., Badges and Permits), and shall be responsible for such persons' compliance with all the Airport rules and regulations. A copy of the Contractors' section of the Airport Security rules and regulations are available for Contractor review at the Airport Access Services Office, Concourse A East Subcore, 4th Level. Persons regularly entering the construction areas must obtain personnel access badges from the Airport Access Services Office and must display badges, at all times, upon entering the construction, restricted and sterile areas of the airport. Any employee, subcontractor or supplier who violates such rules may be subject to revocation of his access authorization, including authorization for access to the construction site and all other restricted and sterile areas.

The security status of the Airport is subject to change without notice. These contract Special Conditions are applicable to the current security status of the Airport. Should the security status of the Airport change at any time during the term of this Contract, a written notice shall be issued to the Contractor detailing all applicable security modifications from the airport's current security status. The Contractor shall take **immediate steps** to comply with those security modifications as directed in the written notice.

If these security modifications involve any additional project cost, the Contractor shall submit a Contractor Change Request in accordance with the General Conditions for the additional cost. The Contractor Change Request shall outline in specific detail the effects of the security modifications on the Contractor's performance of the Contract, and shall provide a detailed cost breakdown for each item for which the Contractor is requesting reimbursement.

The Contractor shall return to the City, at contract completion or termination, or upon demand by the City, all access keys issued to it by the City to all areas of the Airport. If the Contractor fails to return any such key or keys at contract completion or termination or upon demand by the City,

the Contractor shall be liable to the City for all the City's costs, including the City's labor costs for employees, incurred in re-coring doors and any other work which is required to prevent compromise of the Airport security system. In order to collect such costs hereunder, the City may withhold funds in such amount from any amounts due and payable to the Contractor under this Contract.

The construction of all the Project / Task Items that involve the breaching of any airport perimeter security boundary or continued access to restricted access rooms or areas will require the posting of authorized contract security personnel to maintain required security controls. The Contractor's **Guarantee Maximum Price / Total Contract BID Amount / Task Order Proposal** shall include the cost of providing security services to maintain control and supervision of any and all airport perimeter security boundary breaches and for the duration of work activities where access to restricted areas is required and until the airport perimeter security boundaries are reestablished.

When security boundaries are opened for any reason, the Contractor must maintain one hundred percent (100%) control and supervision for the entire time that the openings are present to prevent unauthorized access to the secure / restricted access areas.

**THE IMPORTANCE OF THIS SPECIAL CONDITION CANNOT BE OVER-EMPHASIZED. SEVERE FINANCIAL PENALTIES AS WELL AS CONTRACT TERMINATION COULD RESULT IF AIRPORT PERIMETER SECURITY REQUIREMENTS ARE NOT STRICTLY FOLLOWED. THE REQUIREMENT TO PROVIDE ONE HUNDRED PERCENT (100%) CONTROL AND SUPERVISION OF BREACHES IN THE AIRPORT'S PERIMETER SECURITY BOUNDARY IS ABSOLUTE. AT NO TIME, DURING WORK AND NON-WORK HOURS SHALL ANY BREACHES IN THE AIRPORT'S SECURITY PERIMETER BE UNSUPERVISED AND / OR UNSECURED.**

For off-hours of construction, the Contractor may choose to erect a temporary wall to close all perimeter openings. The wall construction shall be of sufficient materials and strength to prevent access to the airport's Sterile/Restricted Areas. The Contractor shall submit for review and approval, the details and materials for the temporary closure of security perimeter breaches for review and approval.

The Contractor will provide contract security guard services to maintain supervision of these openings. The security services must provide coverage to allow for lunch breaks, comfort breaks and etc. The security services **must** be obtained from the following contract security guard company:

HSS  
900 S. Broadway, Suite 100  
Denver, Colorado 80209  
DIA Contact: (303) 342-4323



All security guards provided for this project must have a Denver Airport SIDA Badge.

The DIA Security Guard Contractor may change between the bidding or proposal phase of this contract from Notice to Proceed to closure of all security perimeter breaches. The Contractor shall maintain a contractual relationship with the Security Guard Contractor holding the most current contract with Denver International Airport.

The Contractor shall continue to provide security of these areas until such time that the breaches in the airport's security perimeter have been permanently secured.

The Contractor shall submit a written security plan for approval to the Director of Airport Security prior to the start of construction on any work where a breach of the perimeter security boundaries is required.

#### **SC-10 CONSTRUCTION ACCESS**

The work site is located south of the Airport along Valley Head Street, near the east end of the Mt. Elbert Parking Lot. The Contractor shall have access to the work site via Jackson Gap Street and East 71st Avenue.

The City will not provide parking spaces for the Contractor's employees or subcontractor employees at the Airport. Arrangements for transportation and parking for all of its and its subcontractors employees will be the responsibility of the Contractor. The Total Contract Proposal Amount or Contract Amount shall include any and all costs associated with the Contractor's and subcontractors' employee parking. Information about parking facilities and charges is available from the Airport Parking Office. Refundable deposits are required for all parking passes.

Unless specifically required by the Contract Documents, the Contractor shall install no fences or other physical obstructions on or around any project work area without the approval of the City.

#### **SC-11 VEHICLE PERMITTING**

Vehicle access on the Airport Operation Area ("AOA") is controlled by and requires permission from the Airport Access Services Office. It is not anticipated that the Contractor will need to operate vehicles on the AOA to perform the Work. Only direct construction support vehicles and/or equipment will be allowed in the contractor's work areas or sites.

#### **SC-12 VENDORS AND SUPPLIERS**

The Contractor shall provide the Project Manager's office with a list of its equipment/material vendors and suppliers. Vendors or suppliers shall access the construction work areas via the Contractor's access route, described in SC-10 above. All delivery vehicles are subject to search.

#### **SC-13 COMMUNICATION DEVICES**

Any site communications devices, mobile communication devices or internet data devices used at DIA must be approved by DIA Technologies.

#### **SC-14 USE, POSSESSION OR SALE OF ALCOHOL OR DRUGS**

The Contractor and its officers, agents, and employees shall cooperate and comply with the provisions of Executive Order No. 94 and Attachment A thereto concerning the use, possession, or sale of alcohol or drugs. Violation of these provisions or refusal to cooperate with implementation of the policy can result in the City's barring the Contractor from City facilities or participating in City operations.

#### **SC-15 ATTORNEY'S FEES**

Colorado Revised Statute 38-26-107 requires that in the event any person or company files a verified statement of amounts due and unpaid in connection with a claim for labor and materials supplied on this project, the City shall withhold from payments to the Contractor sufficient funds to insure the payment of any such claims. Should the City and County of Denver be made a party to any lawsuit to enforce such unpaid claims or any lawsuit arising out of or relating to such withheld funds, Contractor agrees to pay to the City its costs and a reasonable attorney's fee. Because the City Attorney Staff does not bill the City for legal services on an hourly basis, Contractor agrees a reasonable fee shall be computed at the rate of one hundred dollars per hour of City Attorney time.

#### **SC-16 INSURANCE TO BE PROVIDED BY THE CONTRACTOR**

In accordance with the provisions of Title 16 of the General Conditions, the minimum insurance requirements for this contract are set forth in the Sample Insurance Certificate attached to these Special Conditions. The Contractor specifically agrees to comply with each condition, requirement or specification set forth in the attachment for each required coverage during all periods when the required coverage's are in effect.

Contractor and sub-contractors shall procure and maintain until all of their obligations have been discharged, including any warranty periods under this Contract are satisfied, insurance against claims for injury to persons or damage to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees or sub-contractors.

The insurance requirements herein are minimum requirements for this Contract and in no way limit the indemnity covenants contained in this Contract.

The City and County of Denver in no way warrants that the minimum limits contained herein are sufficient to protect the Contractor from liabilities that might arise out of the performance of the work under this Contract by the Contractor, his agents, representatives, employees or sub-contractors. The Contractor shall assess its own risks as it deems appropriate and/or prudent, maintain higher limits and/or broader coverages. The Contractor is not relieved of any liability or other obligations assumed or pursuant to the Contract by reason of its failure to obtain or

maintain insurance in sufficient amounts, duration or types.

Contractor shall furnish the City and County of Denver with certificates of insurance (ACORD form or equivalent approved by CCD) as required by this Contract. The certificates for each insurance policy are to be signed by a person authorized by the insurer to bind coverage on its behalf.

All certificates and any required endorsements are to be received and approved by the City before work commences. Each insurance policy required by this Contract must be in effect at or prior to commencement of work under this Contract and remain in effect for the duration of the project. Failure to maintain the insurance policies as required by this Contract or to provide evidence of renewal is a material breach of the Contract. All insurance coverages for sub-contractors shall be subject to the minimum requirements identified in the Exhibit. All sub-contractors certificates and endorsements shall be received and approved by the Contractor before work commences. The City reserves the right to request copies of these certificates at any time.

All certificates required by this Contract shall be sent directly to Denver International Airport, Business & Technologies, Airport Office Building, Room 8810, 8500 Pena Boulevard, Denver, Colorado 80249. The City project/Contract number and project description shall be noted on the certificate of insurance. The City reserves the right to require complete, certified copies of all insurance policies required by this Contract at any time.

The parties hereto understand and agree that the City and County of Denver, its officers, officials and employees, are relying on, and do not waive or intend to waive by any provisions of this Contract, the monetary limitations or any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, §§ 24-10-101 - 120, C.R.S., or otherwise available to the City and County of Denver, its officers, officials and employees.

In the event the City elects to obtain an Owner Controlled Insurance Program for this project, Owner and Contractor shall maintain insurance in accordance with the provisions of Exhibit O. The Contractor specifically agrees to comply with each condition, requirement or specification set forth in **Exhibit O** for each required coverage during all periods when the required coverage's are in effect.

Contractor shall procure and maintain until all of their obligations have been discharged, including any warranty periods under this Contract are satisfied, insurance against claims for injury to persons or damage to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees or subcontractors. CMGC shall ensure that their first tier subcontractors will comply with Article 16.2 of CMGC's standard subcontract agreement, including any amendments to comply with the requirements of the Owner Controlled Insurance Program (OCIP).

The insurance requirements herein are minimum requirements for this Contract and in no way limit the indemnity covenants contained in this Contract.

The City and County of Denver in no way warrants that the minimum limits contained herein are

sufficient to protect the Contractor from liabilities that might arise out of the performance of the work under this Contract by the Contractor, his agents, representatives, employees or sub-consultants. The Contractor shall assess its own risks as it deems appropriate and/or prudent, maintain higher limits and/or broader coverages. The Contractor is not relieved of any liability or other obligations assumed or pursuant to the Contract by reason of its failure to obtain or maintain insurance in sufficient amounts, duration or types.

Contractor and City shall furnish the City and County of Denver with certificates of insurance (ACORD form or equivalent approved by CCD) as required by this Contract. The certificates for each insurance policy are to be signed by a person authorized by the insurer to bind coverage on its behalf.

All certificates and any required endorsements are to be received and approved by the City and Contractor before work commences. Each insurance policy required by this Contract must be in effect at or prior to commencement of work under this Contract and remain in effect for the duration of the project. Failure to maintain the insurance policies as required by this Contract or to provide evidence of renewal is a material breach of the Contract. All insurance coverages for subcontractors shall be subject to the minimum requirements identified in the Exhibit. All subcontractors' certificates and endorsements shall be received and approved by the Contractor before work commences. The City reserves the right to request copies of these certificates at any time.

All certificates required of Contractor by this Contract shall be sent directly to Denver International Airport, Business & Technologies, Airport Office Building, Room 8810, 8500 Pena Boulevard, Denver, Colorado 80249. The City project/Contract number and project description shall be noted on the certificate of insurance. The City reserves the right to require complete, certified copies of all insurance policies required by this Contract at any time.

The parties hereto understand and agree that the City and County of Denver, its officers, officials and employees, are relying on, and do not waive or intend to waive by any provisions of this Contract, the monetary limitations or any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, §§ 24-10-101 - 120, C.R.S., or otherwise available to the City and County of Denver, its officers, officials and employees.

City shall provide an Owner Controlled Insurance Program (OCIP) in compliance with **Exhibit O**, which coverage City agrees will be primary over any other insurance provided by an enrolled party. City agrees to allow Contractor to review all proposed coverage forms and OCIP manual prior to implementation of the OCIP. Following implementation of the OCIP, Contractor agrees to provide a credit to the City for the cost of insurance coverage being provided by the OCIP. The amount of such credit will be determined based upon a review of actual OCIP coverages. The City shall be named as an additional insured on Contractor's general liability policy in the event that Contractor includes the costs of said coverage in the GMP.

#### BUILDER'S RISK INSURANCE

The Owner shall purchase and maintain property insurance written on a builder's risk "all risk" or equivalent policy form to the full insurable value of the Project on a replacement cost basis.

The insurance shall provide coverage against the perils of fire and extended coverage, theft, vandalism, malicious mischief, collapse, rigging and hoisting, flood, earthquake, windstorm, testing, debris removal, terrorism and other perils or causes of loss customarily covered under an All Risk policy. This insurance shall also cover portions of the work stored off the site and also portions of the work in transit. Owner shall provide a copy of the policy upon request of Contractor.

Such property insurance shall be maintained until final completion. The insurance shall include the Contractor, and Subcontractors of any tier as additional insureds.

If the property insurance requires deductibles, the Owner shall be responsible for such deductibles.

Loss of Use. The Owner, at the Owner's option, may purchase and maintain such insurance as will insure the Owner against loss of use of the Owner's property due to fire or other hazards, however caused. The Owner waives all rights of action against the Contractor for loss of use of the Owner's property, including consequential losses due to fire or other hazards however caused.

Waiver of Subrogation - Adjacent Property and Completed Project If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site, or if after final payment property insurance is to be provided on the completed Project, the Owner shall waive all rights in accordance with the terms of the waiver of Subrogation below for damages caused by fire or other causes of loss covered by such property insurance. All policies shall provide this waiver of subrogation by endorsement or otherwise.

Waivers of Subrogation. The Owner and Contractor waive all rights against each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other for damages caused by fire or other causes of loss to the extent covered by property insurance obtained pursuant to this contract or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

#### **SC-17 SUBCONTRACTOR RELEASES**

The release form referred to in General Condition 907 is attached to these Special Conditions. It is entitled "Denver International Airport Partial Release."

#### **SC-18 ADDITIONAL AFFIRMATIVE ACTION REQUIREMENTS, FEDERAL PROVISIONS**

This contract is subject and subordinate to the terms, reservations, restrictions, and conditions of

any existing or future agreements between the City and the United States, the execution of which has been or may be required as a condition precedent to the transfer of federal rights or property to the City for airport purposes, and the expenditure of federal funds for airport purposes. The “Federal Requirements” section attached hereto is made a part of this Contract.

#### **SC-19 APPLICATIONS FOR PROGRESS PAYMENTS; G.C. 902.3**

General Condition 902.3 is amended to read as follows:

“3. The Contractor shall prepare an estimate of Work completed on application for progress payment forms supplied by the Project Manager. These forms shall be completed in the computerized format or such format as required by of the Technical Specifications. The Contractor shall submit with the application for progress payment a monthly progress report and a schedule showing actual progress to date compared with scheduled progress and the releases required by G.C. 902. The Project Manager after the receipt of each application of progress payment review the application and either recommend to the Deputy Manager such amounts as the Project Manager reasonably determines are due or notify the Contractor in writing of the reasons withholding his approval as provided in G.C. 902. The estimate, when recommended by the Project Manager and signed by the Deputy Manager, establishes the total amount due the Contractor. From this estimate are deducted sums already paid and sums to be withheld. This estimate is then attached to a standard City payment voucher. The estimate of Work completed and the payment voucher, are then sent to the Manager of Finance of the City where a pre-audit examination (including Contractor's and subcontractor's payrolls) is conducted, and upon approval by the Manager of Finance, a warrant is issued.”

#### **SC-20 ESTIMATED QUANTITIES OF UNIT PRICED ITEMS**

The “total estimated quantity” of each unit price item as stated on the bid schedules shall be the estimated quantity which is used to determine the percentage of change in such item for purposes of G.C. 1104.7

#### **SC-21 REVISIONS TO G.C. 1102**

G.C. 1102.2 is amended by replacing the phrase “Change Request” in all its occurrences in such G.C. with the phrase “Change Notice.”

G.C. 1102.3 is amended by replacing the phrase “Field Order/Change Order Directive” in all its occurrences in such G.C. with the phrase “Change Order Directive.”

#### **SC-22 LISTING OF ACCEPTABLE MANUFACTURERS**

The Technical Specifications list “Acceptable Manufacturers” for certain products. Such listing identifies manufacturers of certain products which have been determined by a preliminary review to be able to meet the basic product and/or system technical requirements. The listing is not intended to provide a blanket endorsement or acceptance of the manufacturer’s specified products or product line. All products from listed manufacturers must meet the detailed

requirements of the Technical Specifications. Products that do not meet all detailed Technical Specifications are not acceptable and will be rejected, regardless of whether the manufacturer was listed as “acceptable.” The Contractor is responsible for determining the acceptability of all products under the Technical Specifications prior to submission of products for approval.

## **SC-23 ACCESSIBLE PARKING SPACES, ACCESS AISLES AND ROUTES OF TRAVEL**

If any Work is performed in or adjacent to parking facilities at the Airport, the Contractor is responsible for compliance with this SC-30. “Accessible” parking spaces and access aisles as used in this SC-30 mean parking spaces and access aisles which are accessible for, and reserved for use by, persons with disabilities. These parking spaces and access aisles are designed and built to standards established by federal regulations implementing the Americans with Disabilities Act of 1990 (“ADA”), and are marked by signage. “Accessible routes of travel” as used herein means routes through parking facilities which comply with ADA accessibility standards, including degree of slope and absence of obstructions.

Accessible routes of travel and accessible parking spaces and access aisles must be kept free of obstructions and construction debris at all times. No accessible parking spaces or access aisles or accessible routes of travel shall be relocated, blocked or rendered unusable unless the contractor has obtained specific advance approval in writing for such actions from the airport’s ADA Compliance Officer.

When prosecution of the Work requires that accessible spaces be temporarily blocked, those accessible spaces and their access aisles shall be temporarily relocated to another location as close as possible to an accessible building entrance. Temporary signage that identifies these parking spaces and access aisles as reserved for the handicapped shall be installed, and the accessible route shall be clearly marked as required.

Before blocking or relocating accessible parking spaces or accessible routes of travel, the contractor must obtain written approval from the DIA ADA Compliance Officer, by submitting a completed request form, which will be provided to the Contractor by the Project Manager at the preconstruction meeting if it is not included as a standard form in Section 01999 of the Technical Specifications. The request shall include the location of alternative spaces and/or routes, and specifications of the temporary signage to be used. Work shall not proceed without this approval.

If a vehicle is parked in any accessible space which is either temporary or approved to be relocated, the contractor will not remove signage or take any other action which would allow the access aisle for such parking space to be blocked. Such actions must be postponed until the parking space is no longer occupied.

## **SC-24 SUBCONTRACTOR PAYMENTS AND SUBCONTRACTOR RELEASES – REQUIRED USE OF THE B2G CONTRACT MANAGEMENT SYSTEM**

The Contractor is required to use the City B2G Contract Management System to report all subcontractor payments and shall adhere to the City’s Procedure for Reporting Subcontractor

Payments. It is the Contractor's obligation to ensure that complete subcontractor information is entered into the B2G System prior to submission of the first application for payment in order to avoid any delays in payment. The Contractor shall, prior to the submission of each subsequent invoice, ensure payments to subcontractors have been entered into the B2G System, including subcontractor confirmation of amount of payment received, for services performed during the prior billing period.

**SC-25 CHANGES AND/OR ADDITIONS TO THE CONSTRUCTION CONTRACT  
GENERAL CONDITIONS HEREINAFTER REFERRED TO AS "GCs:"**

- Architect / Engineer - The term architect / engineer shall mean professionals licensed and/or registered by the State of Colorado who have contracted with the Design-Build Contractor or who is otherwise a part of the Design-Build Contractor to accomplish the architectural and engineering services necessary for the Project.
- GC 106 CONTRACTOR - Any reference to the term "Contractor" in the General Contract Conditions or elsewhere in the Contract Documents shall mean the Design-Build Contractor.
- GC 107 CONTRACTOR PERSONNEL - Any reference to the term "Contractor Personnel" in the General Contract Conditions or elsewhere in the Contract Documents shall mean the Design-Build Contractor.
- GC 110 DESIGNER – Any reference to the term "Designer" in the General Contract Conditions or elsewhere in the Contract Documents shall mean the Design-Build Contractor.
- GC 313 SUGGESTIONS TO CONTRACTOR - delete "or by Designer" in the first sentence.
- GC 401 CONTRACTOR DOCUMENTS, REVIEW AND INTERPRETATION - The intent, standards and documents' interpretation in this General Condition remains the same as stated, however the application of this section should be read to harmonize it with the understanding that the Design-Build Contractor has the principle responsibility for Project drawings and specifications. If conflicts or variances are discovered, then any modifications, deletions, changes or additions to the Contract Documents, as addressed in this General Condition, must be submitted to the Project Manager and City for review and approval.
- GC 403 CONTRACT DRAWINGS AND TECHNICAL SPECIFICATIONS ISSUED TO THE CONTRACTOR - The application of this section should be read to harmonize it with the understanding that the Design-Build Contractor has the principle responsibility for the for development of the Project drawings and specifications.



.1 is deleted and replaced with the following:

The Design-Build Contractor shall provide the City, at no charge, with electronic file or files containing the Project BIM Models, Drawings and Specifications.

.2 is deleted and replaced with the following:

The Design-Build Contractor must retain and maintain the Project BIM Models, Drawings and Specifications in good condition at the work site for the purpose of recording “as-built” conditions in order to develop a record of the construction of the work. The Design-Build Team shall daily record all changes and deviations in a neat and legible manner.

.3 is deleted and replaced with the following:

The Contract Documents provided to the City by the Design-Build Contractor shall be provided to its Subconsultants, Subcontractors, Vendors and Suppliers in identical form.

- GC 404 REQUESTS FOR INFORMATION OR CLARIFICATION – This section remains the same with note that the Design-Build Contractor produces all Contract Drawings and Technical Specifications, therefore requests for review, information and clarification are internal to the Design-Build Contractor, however all such requests shall also be reviewed and approved by the Project Manager.
- GC 405 SHOP DRAWINGS, PRODUCTDATA AND SAMPLES – delete all references therein to “Designer” and replace with “Project Manager” if not already so referenced.
- GC 1401 DIFFERING SITE CONDITIONS

.1 is deleted and replaced with the following:

The Design-Build Contractor shall be responsible for a reasonable investigation of the soil and subsurface conditions, and before such conditions are disturbed, notify the Project Manager, first verbally and later with a properly documents, of the following:

- A. A description of the subsurface physical conditions at the work site differing materially from those indicated in historical documentation provided by the City; or
- B. Unknown physical conditions at the Work site, of an unusual nature, differing materially from those ordinarily encountered and generally

recognized as inherent in conditions located on the airport site or described in other available documentation.

- **GC 1402 SITE INSPECTIONS AND INVESTIGATIONS**

.1 Delete the first three sentences.

.2A is deleted and replaced with the following:

The Design-Build Contractor acknowledges that certain soil reports, borings and other geotechnical data have been made available for inspection and review, if available, from the City. These borings and other geotechnical data may have been made by the City or City's consultants and contractors from prior projects and were not intended to provide accurate data for the Project nor are they intended to be interpreted for use in temporary construction facilities designed by the Design-Build Contractor.

- **GC Title 15 PERFORMANCE AND PAYMENT BONDS** - This section is not applicable to the design phase of the Project.
- **GC 1903 CERTIFICATE OF SUBSTANTIAL COMPLETION** – the first sentence of this GC is deleted and replaced with the following:

When the Project Manager determines that the Work or designated portions thereof are complete, the Project Manager will prepare, a Certificate of Substantial Completion of the Work which shall establish the Date of Substantial Completion of the Work.

#### **SC-27 BENEFIT TO CITY**

All the General Conditions are to be read and applied with the understanding that this is a Design-Build Contract and that if a particular General Condition appears to be ambiguous as to its application or affect that such General Conditions shall be interpreted or construed so as to benefit the City.

#### **SC-28 WAIVER OF COLORADO CONSTRUCTION DEFECT ACTION REFORM ACT**

**Waiver of C.R.S. 13-20-802 et. seq.:** The Design-Build Contractor specifically waives all the provisions of Chapter 8 of Article 20 of Title 13, Colorado Revised Statutes (also designated C.R.S. 13-20-802 et. seq.) relating to design and construction defects in the Project under this Agreement.

#### **SC-29 LEED CERTIFICATION**

The Design-Build Contractor shall provide all necessary design and construction services for the

Project to obtain and be certified for LEED® Silver Certification with the goal of achieving LEED® Gold Certification, through the Green Building Certification Institute (GBCI), U.S. Green Building Council (USGBC), under the LEED® 2009 Rating System or the most current at time of Project registration.

### **SC-30 GREENPRINT DENVER OFFICE AND SUSTAINABILITY POLICY**

Where applicable, the Design-Build Contractor shall provide all necessary design and construction services for the Project to comply with Executive Order No. 123 – Greenprint Denver Office and Sustainability Policy. Such compliance shall include, but not limited to, LEED Certification and Energy Star.

### **SC-31 PAYMENT PROCEDURE REQUIREMENTS**

Contractor recognizes and agrees that it shall be required to use the Textura® Construction Payment Management System (CPM System) for this Project. Bidders are urged, when preparing a bid, to contact the Textura® Corporation at 866-TEXTURA (866-839-8872) for pricing schedule and fees, as all fees associated with the CPM System are to be paid by the Contractor and subcontractor for billings for work performed.

### **SC-32 CHANGES AND/OR ADDITIONS TO THE EXHIBIT O, OCIP SAFETY MANUAL, V1 – SECTION 4. SAFETY RESPONSIBILITIES & QUALIFICATIONS**

- 4.1 CONTRACTOR SAFETY REPRESENTATIVE, SECTION 4.1.A. – For this Contract, a fulltime safety professional can be a qualified working foreman, supervisor or superintendent, providing he or she meets the qualifications as set forth in this SC-32 and Exhibit O in this Contract.
- 4.1 CONTRACTOR SAFETY REPRESENTATIVE, SECTION 4.1.B. – Delete the section in its entirety and replace with the following.

B. The qualifications of the Contractor's safety representative must be submitted to the Program Manager and OCIP Safety Team for review prior to assignment to the site. Approval will depend upon the following qualifications and experience:

- 1) BCSP (Board of Certified Safety Professionals) certified STS (Safety Trained Supervisor).
- 2) Have at least 5 years of relevant construction safety and health experience.
- 3) Completed the OSHA 30 course for construction within the last 24 months.
- 4) Provide proof of completion of a Red Cross or approved equal for Cardio – Pulmonary Resuscitation (CPR), First Aid, Automated External Defibrillation (AED), and blood-borne pathogens training course.
- 5) Completion of drug and alcohol reasonable suspicion training.
- 6) Knowledge of safety representatives' responsibilities.

# **EXHIBIT G**

## **PERFORMANCE BOND**

**DIA Data Center**

**Contract Number 201310374**

**June 2013**

**DEPARTMENT OF AVIATION**  
**City & County of Denver**



**DENVER INTERNATIONAL AIRPORT**

**AIRPORT INFRASTRUCTURE MANAGEMENT**

## PERFORMANCE BOND

**KNOW ALL MEN BY THESE PRESENTS**, that we, the undersigned PCL CONSTRUCTION a corporation organized under the laws of the State of COLORADO, hereinafter referred to as the "Contractor" and \_\_\_\_\_, a corporation organized under the laws of the State of \_\_\_\_\_, and authorized to transact business in the State of Colorado, hereinafter referred to as Surety, are held and firmly bound unto the CITY AND COUNTY OF DENVER, a municipal corporation of the State of Colorado, hereinafter referred to as the "CITY", in the penal sum of TEN MILLION DOLLARS and NO Cents (\$10,000,000.00) lawful money of the United States of America, for the payment of which sum the Contractor and Surety bind themselves and their heirs, executors, administrators, successors and assigns, jointly and severally by these presents.

**WHEREAS**, the above Contractor has entered into a written contract with the City for furnishing all labor, materials, equipment, tools, superintendence, and other facilities and accessories for the construction of Contract No. 201207370, DIA Data Center, Denver International Airport, in accordance with the Technical Specifications, Contract Drawings and all other Contract Documents therefor which are incorporated herein by reference and made a part hereof, and are herein referred to as the Contract.

**NOW, THEREFORE**, the condition of this performance bond is such that if the Contractor:

1. Promptly and faithfully observes, abides by and performs each and every covenant, condition and part of said Contract, including, but not limited to, its warranty provisions, in the time and manner prescribed in the Contract, and
2. Pays the City all losses, damages (liquidated or actual, including, but not limited to, damages caused by delays in the performance of the Contract), expenses, costs and attorneys' fees, that the City sustains resulting from any breach or default by the Contractor under the Contract, then this bond is void; otherwise, it shall remain in full force and effect.

**IN ADDITION**, if said Contractor fails to duly pay for any labor, materials, team hire, sustenance, provisions, provender, or any other supplies used or consumed by said Contractor or its subcontractors in its performance of the work contracted to be done or fails to pay any person who supplies rental machinery, tools, or equipment, all amounts due as the result of the use of such machinery, tools, or equipment in the prosecution of the work, the Surety shall pay the same in an amount not exceeding the amount of this obligation, together with interest as provided by law.

**PROVIDED FURTHER**, that the said Surety, for value received, hereby stipulates and agrees that any and all changes in the Contract or compliance or noncompliance with the formalities in the Contract for making such changes shall not affect the Surety's obligations under this bond and the Surety hereby waives notice of any such changes.

(End of Page)

**IN WITNESS WHEREOF**, said Contractor and said Surety have executed these presents as of this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
CONTRACTOR

By: \_\_\_\_\_  
President

\_\_\_\_\_  
SURETY

By: \_\_\_\_\_  
Attorney-in-Fact

(Accompany this bond with Attorney-in-Fact's authority from the Surety to execute bond, certified to include the date of the bond.)

**CITY AND COUNTY OF DENVER**

By: \_\_\_\_\_  
MAYOR

By: \_\_\_\_\_  
Manager of Aviation

**APPROVED AS TO FORM:**

DOUGLAS J. FRIEDNASH, Attorney for the  
City and County of Denver

By: \_\_\_\_\_  
Assistant City Attorney

# **EXHIBIT H**

## **PAYMENT BOND**

**DIA Data Center**  
**Contract Number 201310374**

**June 2013**

**DEPARTMENT OF AVIATION**  
**City & County of Denver**



**DENVER INTERNATIONAL AIRPORT**

**AIRPORT INFRASTRUCTURE MANAGEMENT**

## **PAYMENT BOND**

**KNOW ALL MEN BY THESE PRESENTS**, that we, the undersigned PCL CONSTRUCTION SERVICES, INC., a corporation organized under the laws of the State of COLORADO, hereinafter referred to as the "Contractor" and \_\_\_\_\_, a corporation organized under the laws of the State of \_\_\_\_\_, and authorized to transact business in the State of Colorado, hereinafter referred to as Surety, are held and firmly bound unto the CITY AND COUNTY OF DENVER, a municipal corporation of the State of Colorado, hereinafter referred to as the "CITY", in the penal sum of TEN MILLION Dollars AND No Cents (\$10,000,000.00), lawful money of the United States of America, for the payment of which sum the Contractor and Surety bind themselves and their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

**WHEREAS**, the above Contractor has entered into a written contract with the City for furnishing all labor, materials, tools, superintendence, and other facilities and accessories for the construction of Contract No. 201207370, DIA Data Center, Denver International Airport, in accordance with the Technical Specifications, Contract Drawings and all other Contract Documents therefor which are incorporated herein by reference and made a part hereof, and are herein referred to as the Contract.

**NOW, THEREFORE**, the condition of this payment bond obligation is such that if the Contractor shall at all times promptly make payments of all amounts lawfully due to all persons supplying or furnishing it or its subcontractors with labor and materials, rental machinery, tools, or equipment, used or performed in the prosecution of work provided for in the above Contract and shall indemnify and save harmless the City to the extent of any and all payments in connection with the carrying out of such Contract which the City may be required to make under the law, then this obligation shall be null and void, otherwise, it shall remain in full force and effect;

**PROVIDED FURTHER**, that the said Surety, for value received, hereby stipulates and agrees that any and all changes in the Contract, or compliance or noncompliance with the formalities in the Contract for making such changes shall not affect the Surety's obligations under this bond and the Surety hereby waives notice of any such changes.

[END OF PAGE]



**IN WITNESS WHEREOF**, said Contractor and said Surety have executed these presents as of this \_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
CONTRACTOR

By: \_\_\_\_\_  
President

\_\_\_\_\_  
SURETY

By: \_\_\_\_\_  
Attorney-in-Fact

(Accompany this bond with Attorney-in-Fact's authority from the Surety to execute bond, certified to include the date of the bond.)

CITY AND COUNTY OF DENVER

By: \_\_\_\_\_  
MAYOR

By: \_\_\_\_\_  
Manager of Aviation

APPROVED AS TO FORM:

DOUGLAS J. FRIEDNASH, Attorney for the  
City and County of Denver

By: \_\_\_\_\_  
Assistant City Attorney

# **EXHIBIT I**

## **GENERAL REQUIREMENTS**

### **DIVISION 1**

(Incorporated by Reference upon City Acceptance)

**DIA Data Center**

**Contract Number 201310374**

**June 2013**

**DEPARTMENT OF AVIATION  
City & County of Denver**



**DENVER INTERNATIONAL AIRPORT**

**AIRPORT INFRASTRUCTURE MANAGEMENT**

## **DIVISION 1 – GENERAL REQUIREMENTS**

### **SECTION 01 11 00**

#### **SUMMARY OF WORK**

**PART 1 - THIS SECTION MUST BE EDITED BY THE DESIGNER OF RECORD TO INCLUDE WORK DESCRIPTION AND WHAT IS INCLUDED IN THE SCOPE OF WORK. EXPLANATIONS OF ITEMS INTENDED TO BE INCLUDED IN THE 100% CD. EPLANATION OF SYSTEMS NOT FULLY DESCRIBED IN THE DOCUMENTS ISSUED FOR PRICING. THE CONSTRUCTON PROJECT MANAGER MUST EDIT THE SECTIONS SHOWING IN THE EDIT MODE AND SELECT THE APPLICABLE CHOICES AS INSTRUCTED.**

#### **1.01 DESCRIPTION**

- A. The Work specified in this contract consists of furnishing all management, supervision, labor, materials, tools, equipment, services, testing and incidentals for the construction of the Work indicated in the contract documents including lump sum items and unit price items.
- B. The Work in this Contract may impact operations of Denver International Airport. The Contractor shall bid, plan and execute the Work so as to minimize disruption of operations and inconvenience to the public.
- C. This project will be administered using the CM Manager Software. The software will be supplied by the Owner at no cost to the Contractor. The Contractor will be required to train its officers to the use of this software and use the software for all contract administration processes.
- D. This Project will require full implementation of the BIM by Revit program. The contractor shall follow the BIM Execution Plan.
- E. This Project will be controlled by a P6 Primavera program. All schedules shall be resource and cost loaded to the extent identified in the related sections of this specifications and as agreed upon with DIA Project Control.
- F. This Project will be required to submit all the requirements of the survey and layout requirements identified in section 013223 of this Technical Specification. Consult with DIA Planning for any assistance in compliance.
- G. This Project is required to partially comply with the requirements of section 013223 of this Technical Specification. Consult with DIA Planning section for further clarifications.
- H. This Project utilizes the Contractor paid Independent Testing Agency for all Quality Control 100 Percent frequency required in the Technical Specification. The Owner will utilize owner employed testing agency and Owner employed Special Inspection Agency.

#### **1.02 WORK BY OTHERS**

- A. The Contractor is hereby notified that there may be other construction activities now and in the future within the project areas and adjacent to the worksites throughout the duration of this contract. The Contractor is responsible for keeping apprised of other projects and worksites and how they may affect the work.

- B. The Contractor shall maintain contact with the City and with other contractors to schedule work to minimize the effect of such construction activities on other site activities. The Contractor shall also maintain, at the direction of the Project Manager, contact with tenants to ensure minimal disruption to tenant operations.

### 1.03 FUTURE WORK

- A. The Contractor is hereby notified that there may be other future construction activities within the project and adjacent to the worksites that are scheduled after completion of this contract. It is the Contractor's responsibility to keep apprised of such projects and how they may affect the Work.

### 1.04 SITE CONDITIONS

- A. The Contractor acknowledges satisfaction as to the nature and location of the Work, all of the general and local conditions, particularly those bearing upon availability of transportation, access to the site, disposal, handling and storage of materials, availability of labor, water, power, roads, and uncertainties of weather, or similar physical conditions at the site, the conformation and conditions of the ground, the character of equipment and facilities needed preliminary to and during work, and all other matters that can in any way affect the work or the cost thereof under this contract.
- B. The Contractor further acknowledges, by submission of a bid and on each Work Request bid, satisfaction as to the character, quality and quantity of all surface and subsurface materials and all features on top of the surface or at worksites that would be encountered from his inspection of the site and from reviewing available records of exploratory work furnished by the City. Failure by the Contractor to become acquainted with the physical conditions of the sites and all the available information will not relieve the Contractor from responsibility for properly estimating the difficulty or cost of performing the Work.
- C. The Contractor warrants that as a result of examination and investigation of all the aforesaid data and the site, that the Contractor can perform the Work in a good and workmanlike manner and to the satisfaction of the City. The City assumes no responsibility for any representations made by any of its officers or agents during or prior to the execution of this contract unless such representation is expressly stated in the contract.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.01 CONTRACTOR'S DUTIES

- A. Except as otherwise specified, furnish the following to the full extent required by the contract:
  - 1. Labor, superintendence, supervision and products.
  - 2. Construction equipment, tools, machinery and materials.
  - 3. Utilities required for construction and related activities.
  - 4. Other facilities and services necessary to properly execute and complete the Work, including security for worksite, testing and storage and protection of all materials awaiting incorporation into the Work, providing a safe working environment for workers, City and County of Denver representatives, and the public in accordance with all local,

state and federal requirements.

- B. Prosecute the Work as specified and in a timely manner. Submit a schedule of Work that will be performed at times other than during the eight-hour working day of Monday through Friday, daylight hours. Submit this schedule five working days prior to the beginning of Work to the Project Manager for review and acceptance. Approval to work at night may be obtained after Contractor presents a written program outlining special precautions to be taken to control the extraordinary hazards presented by night work. That program shall include, but not limited to, supplementary lighting of work areas, availability of medical facilities, security precautions and noise limitations.

### 3.02 COORDINATION

- A. Coordinate prosecution of the Work with those public utilities, governmental bodies, private utilities and other contractors performing work on and adjacent to the worksites. Eliminate or minimize delays in the Work and conflicts with those utilities, bodies and contractors. Schedule governmental, private utility and public utility work that relies upon survey points, lines and grades established by the Contractor to occur immediately after those points, lines and grades have been established. Confirm coordination measures for each individual case with the City in writing.
- B. In the coordination effort of work by others, the Contractor shall obtain and refer to equipment locations and other layouts, as available, to avoid interface problems.
- C. The City reserves the right to permit access to the site of the Work for the performance of work by other contractors and persons at such times that the City deems proper. The exercise of such reserved right shall in no way or to any extent relieve the Contractor from liability for loss and damage to the work due to or resulting from its operations or from responsibility for complete execution of the Contract. The Contractor shall cooperate with other contractors and persons in all matters requiring common effort.

### 3.03 CONTRACTOR USE OF WORKSITE

- A. Confine worksite operations to areas permitted by law, ordinances, permits and the contract.
- B. Consider the safety of the Work and that of the people and property on and adjacent to the worksite when determining amount, location, movement and use of materials and equipment on worksite.
- C. Do not load worksite with equipment and products that would interfere with the Work. Only equipment, tools or materials required for this Work may be stored at the worksite.
- D. Protect products, equipment and materials stored on worksite.
- E. Relocate stored products, equipment and materials which interfere with operations of City, government bodies, public and private utilities, and other contractors.

## PART 4 - MEASUREMENT

### 4.01 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

**5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this section including any and all necessary relocations requested by the City. The cost of the work described in this section shall be included in the applicable multiplier or bid items contract price.

**END OF SECTION 01 11 00**

## SECTION 01 42 10

### REFERENCED MATERIAL

#### PART 1 - GENERAL

##### 1.01 REFERENCED MATERIAL

- A. The following documents may be available for examination at the DIA's offices unless otherwise noted. The referenced material and documents are not part of the contract documents unless otherwise specified. Unless otherwise noted, copies of referenced material may be purchased.
1. Environmental Impact Statement (EIS)  
Denver International Airport  
South Terminal Redevelopment Program  
Environmental Assessment Prepared in Association with Parsons by  
Landrum & Brown Incorporated  
11279 Cornell Park Drive,  
Cincinnati, Ohio 45242
  2. Geotechnical Reports
    - a. Borings, other field and laboratory explorations and investigations have been made to indicate subsurface materials at particular locations. Explorations and investigations conducted by designers and their subconsultants are solely for the purpose of study and design.
    - b. The subsurface exploration and investigation information is presented or made available to indicate some of the conditions that may be encountered during construction and is offered as supplementary information only. Geotechnical information presented in the referenced material represents the opinion of soils consultants as to the character of the materials encountered. Subsurface information was directly obtained only at the specified location and necessarily indicates subsurface conditions only at the respective plan location, depths penetrated and only at the time of the exploration.
    - c. Neither the City nor the Designers assume any responsibility whatever in respect to the sufficiency or accuracy of borings made, or of the logs of test borings, or of other investigations, or of the interpretations made thereof, and there is no warranty or guarantee, either expressed or implied, that the conditions indicated by such investigations are representative of those existing throughout such area, or any part thereof, or that unforeseen developments may not occur. It is expressly understood that the making of deductions, interpretations and conclusions from all of the accessible factual information, including the nature of the materials to be excavated, the difficulties of doing other work affected by the geology, groundwater elevations and other subsurface conditions at the site of the Work are the Contractor's sole responsibility.
    - d. Information derived from inspection of logs of borings, topographic maps, technical memorandum, reports or plans showing information of the subsurface of site conditions will not relieve the Contractor from any risk or from properly examining the site and making such additional investigations as he may elect or from properly fulfilling all the terms of the contract documents.
  3. Available Geotechnical Reports:

Geotechnical Investigation Report dated March 11, 2011

Prepared by:

Yeh Associates Inc.

5700 East Evans Avenue

Denver, Colorado

Phone: 303-781-9590

4. Available Conceptual Utility and Drainage Reports:  
Conceptual Utility and Drainage Plan  
Prepared by  
Jvation  
900 S. Broadway, Suite 350  
Denver, CO 80209  
Phone 303-524-3030
5. Denver International Airport Design Standards Manual 12 Engineering Data System dated 2012.
6. Woolpert, Inc Report dated 12/10/2010: A Low Distortion Projection for Denver International Airport (DEN).

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION (NOT USED)**

## **PART 4 - MEASUREMENT**

### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

## **PART 5 - PAYMENT**

### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item.

**END OF SECTION 01 42 10**



## SECTION 01 011400

### WORK SEQUENCE AND CONSTRAINTS

#### PART 1 - ADD ANY NARRATIVE DESCRIBING PHASING, MILESTONES, ALLOWABLE CLOSURES AND CONSTRAINTS REQUIRED OR DUE TO THE EXECUTION OF THE PROJECT.GENERAL

##### 1.01 OTHER WORK

- A. Other concurrent construction contracts with which the Contractor must interface are described elsewhere in the Contract Documents. Refer to Technical Specifications Section 013119 and the Special Conditions for specific work constraints and milestones.

##### 1.02 WORK SEQUENCE

- A. The work sequence shall be in compliance with Phasing, Sequencing and Milestones as indicated in the Contract Documents and in accordance with the approved Construction Schedule developed by the Contractor. The schedule shall be in compliance with requirements indicated in the Special Conditions and Technical Specifications Section 011400 Work Sequence and Constraints. The Construction Schedule is described in Technical Specifications Section 013119 Schedule.

##### 1.03 WORK CONSTRAINTS

###### A. Site Constraints

1. Access to the project shall be generally as indicated in the Contract Documents. Access shall be organized and planned by the Contractor to ensure no disruption of airline or DIA operations.
2. Access to work sites will be strictly monitored and must comply with DIA Airport Operations and FAA Regulations. The Contractor shall provide monitoring and escorts as required by DIA Operations in the area of the work.
3. The Contractor's staging area will be as indicated in the Construction Documents.
4. Contractor employee parking will not be allowed within the existing revenue control system. To access the Terminal building, Contractor employees may use the DIA Landside Employee Parking Lot located on 78th Avenue at a cost of \$30.00 per month per employee. A free DIA shuttle to the Terminal is available from this Lot. Material for work in the Terminal may be brought in through the Terminal Loading Dock accessed via Gate 1. Employee and material access to the Concourses will be via Gate 5.
5. The Contractor shall use the haul routes specified in the plans.
6. If required, the Contractor shall provide a bus and driver to transport the Contractor's employees between the designated employee parking area and the work sites. No separate payment will be made for this bus and driver. The cost shall be included in the bid item "Mobilization". The bus driver shall be provided at all times when Contractor employees are working on the project.

###### B. System Interruptions

1. The Contractor shall submit on approved forms through the DIA Project Manager and copy to DIA Maintenance Control any written requests for system interruptions such as

fire alarm, HVAC, electrical, water systems or other systems. System interruptions shall not be considered if the interruptions interfere with airport operations or tenant operations. Interruptions or system shut down shall be limited to between the hours of 11:00 p.m. and 5:30 a.m. Baggage system shutdown shall be limited to between the hours of 10:00 p.m. and 4:00 a.m. and in accordance with Technical Specifications Section 011400, paragraph 1.03.F. Roadway shutdown times are to be coordinated with Airport Operations, DIA Project Manager prior to submitting a request for approval to shutdown a roadway.

2. The request forms shall be submitted only during the normal work week (Monday through Friday) between 8:00 a.m. and 4:00 p.m.
3. Upon approval of a system shutdown, the Contractor representatives and the individuals performing the work shall remain at the worksite and shall remain in contact with Maintenance Control until such time as the system is restored to working condition. The requesting party shall assume liability for the system until the system is restored to proper working order.
4. Fire Systems, HVAC, and Plumbing: Submit requests five working days prior to the time of requested interruption.
5. Electrical System Interruptions: Submit requests five working days prior to the time of requested interruption.

C. Airfield Operations at Denver International Airport

1. Full airport and aircraft operations are underway adjacent to this project. Contractors are required to obtain a Contractor Participant Manual from the Security Manager and must follow the guidelines in the manual. Copies of the Contractor section of the manual are available for review at the Denver International Airport Access Services Office.
  - a. If any Work contains requirements for Work activities or access through or in the restricted area, reference Technical Specifications Section 011420, 011425 and 011430 for requirements.
  - b. If not in a restricted area, the Contractor personnel still must be badged; reference Technical Specifications Section 01015.

D. CONDUCT OF PERSONS USING THE DENVER MUNICIPAL AIRPORT SYSTEM

1. Contractor activities shall comply with Airport Operations and Regulation 130 TRAFFIC and 20 CONDUCT OF PERSONS USING THE DENVER MUNICIPAL AIRPORT SYSTEM shall be followed. These regulations are available from Airport Operations at Denver International Airport.

E. OPERATIONAL SAFETY ON AIRPORTS DURING CONSTRUCTION

1. All work shall be accomplished in accordance with FAA Advisory Circular AC150/5370-2C, "Operational Safety on Airports During Construction", FAR Part 139 and FAR Part 107 except as herein modified.

F. BAGGAGE SYSTEM SHUTDOWN AND LOCKOUT: Prior to and during work in any area that requires access adjacent to, under, or above baggage systems, the Contractor shall coordinate with baggage system representatives of United Airlines and DIA:

1. Work in these areas shall be limited to between the hours of 10:00 p.m. and 4:00 a.m. The Contractor shall schedule and plan activities within these areas during the shutdown to ensure removal of personnel and equipment within the time frame as

indicated in this Technical Specifications Section. The Contractor shall not have access to the work areas requiring shutdown and lockout during a limited number of selected days. The Contractor shall coordinate with the Project Manager and United Airlines representatives to develop detail scheduling on a day-to-day basis.

2. Scheduling for Shutdown and Lockout: The Contractor shall maintain an on-going one week look-ahead schedule of shutdown/lockout requests including areas identified on plan diagrams. This look-ahead schedule shall be provided daily to the Project Manager and United Airlines representative.
3. Sequence of Shutdown and Lockout
  - a. 10:00 p.m. Shutdown and Lockout. Prior to 10:00 p.m., the Contractor's Superintendent and the Contractor's Safety Representative shall meet with United Airlines baggage system representatives and DIA representatives to review the areas or zones to be inactivated to allow the Contractor to proceed with work.
    - 1) Baggage Mechanical Systems Lockout. United Airlines representatives in conjunction with the Contractor representatives shall install barriers provided by United Airlines on baggage system tracks to isolate the zone of the Contractor's work. The barriers are to ensure no baggage system cart intrusion into the area. Protection of equipment and other barriers are to be provided by the Contractor.
    - 2) Baggage Electrical Systems Lockout. A representative from United Airlines, in conjunction with Contractor representatives, shall place locks on power cabinets supporting baggage equipment for the identified contractor work zone. Each party shall provide a lock.
    - 3) The Contractor may begin work in baggage system zones after the Contractor's Safety Representative has confirmed lockdown and lockout have been completed. The Contractor shall begin work by first providing covers and protection of baggage system and building systems to preclude damage during the Contractor activities. DIA and/or United Airlines representatives prior to the Contractor beginning work shall review all protection systems for acceptance.
  - b. System Activation: The system shall be activated at 4:00 a.m. Before 4:00 a.m. the Contractor shall begin clearance and removal of equipment, materials, barriers, and personnel in areas and envelopes of the baggage system. The Contractor shall take all steps to ensure that all baggage systems envelopes are clear of personnel, protective coverings, and equipment prior to 4:00 a.m. The Contractor's safety representative shall contact the United Airlines representative and shall inspect areas of work to ensure removal by the Contractor of all personnel, materials and equipment between 3:30 a.m. and 4:00 a.m. At 4:00 a.m. the baggage system will be activated. After this time until the next shift (10:00 p.m.), Contractor personnel or equipment shall not be mobilized in the area of the baggage system (generally in the envelope above 8'0" in the basements).

G. Welding Equipment, Procedures and Constraints

1. Natural gas-powered portable welders or "Powcon Inverter" welders are the only acceptable welding equipment to be used inside of building basement or tunnel areas. Acceptability of equipment other than the equipment noted above shall be at the sole discretion of the Project Manager. If the Contractor proposes other types of inverter welding equipment, testing of equipment for harmonics by the Contractor must be completed prior to the request by the Contractor for use of the equipment.
2. Welding activities inside buildings require submittal of a System Interruption Request (See paragraph 1.03.B of this Specifications Section). Prior to welding in any area, the

Contractor shall locate smoke detectors and shall request interruption of the fire alarm system. Subsequent to the interruption of the fire alarm system and prior to welding activities, the Contractor shall cover and protect smoke detectors until work is complete. Prior to expiration of each interruption of the system, the Contractor shall uncover the smoke detectors.

3. Electrical Service: The Contractor shall be responsible for verifying with the DIA Project Manager or representatives locations acceptable for accessing electrical power for welders and other electrical equipment feeders. The Contractor shall be responsible for all work and equipment required to install temporary or permanent electrical modifications for construction power and lighting.
  - a. Temporary Hook-up: Pigtails wired into electrical panels - temporary only: Permanent installation shall require conduit, labeling, and all requirements of Division 16 Technical Specifications. Comply with the following:
    - 1) Provide 20 amp, 3 pole plugs.
    - 2) Wire shall be (4) #10 copper
    - 3) 480V, 3 phase, 3 pole, 4 wire twist lock ground line
    - 4) NEMA L16-20 or ANSI C73.87
  - b. The Contractor may not begin operation of the equipment prior to request for inspection by DIA representatives and acceptance of the installation.
4. Welding Practices: All standard safe welding practices must be followed, including but not limited to the following:
  - 1) Flash protection for surrounding areas
  - 2) Contractor fire extinguisher in area
  - 3) One person in each welding area solely designated as fire watch for each welder
  - 4) Protect all equipment, cable trays and contents, etc. in area
  - 5) Use fire blankets and other appropriate materials to confine sparks and molten metal from the welding, cutting, and/or grinding activities.
  - 6) All welders shall have been qualified through welding tests in accordance with applicable welding code, such as but not limited to AWS, ASME, API, within one year prior to welding taking place. Evidence of qualification shall be through Welding Performance Qualification Records (WPQR).
  - 7) All welder qualifications test shall be or shall have been administered and witnessed by an Independent Testing Agency (ITA), AWS Certified Welding Inspector (CWI).
  - 8) If re-certification of welders is required, delay costs and retesting costs shall be borne by the Contractor.
5. Grounding: Review with DIA representative's area of work prior to beginning work to ensure ground procedures do not induce undesirable charges in steel building system or other systems. This review should take place subsequent to the pre-work meeting. Do not ground to adjacent building systems, baggage system, hangers, or devices that support mechanical or electrical equipment.

H. Cleaning Equipment and Spoils

1. Discharge of water, liquids, or chemicals into the building waste, drain systems or storm drainage systems is prohibited. The Contractor shall comply with all Federal, State, and Local requirements for disposal of chemicals. The Contractor shall maintain and service in work areas containers for discharge of water from cleaning of any construction equipment or removal of water from excavations.

I. Vehicle Permitting for Tunnel and Basement Use

1. Electric carts require permitting. The Contractor shall provide at least one electric cart for Contractor use during the work in the tunnel and basements of the buildings. Only CNG powered trucks are allowed in the tunnel and basements of the buildings. CNG/gasoline trucks may be used and shall not be parked overnight or for long terms within the tunnel or basements. All vehicles require permitting. Permits may be acquired at the DIA Airport Security Office for a fee of \$5.00 each (non refundable) with a \$100.00 deposit (refundable at project completion).
- J. Radio and Cell Phone Use
  1. The Contractor shall have in place prior to initiation of work in the tunnel or basements communications equipment either by use of cell phone and or radio. Cell phone use is limited to “line of sight” communication. Radio equipment shall be submitted to DIA for approval of use at least 14 days prior to intended use. Radio equipment frequencies shall be submitted. Frequencies shall be subject to DIA approval.
- K. Keys
  1. The Contractor shall be required to contact DIA Maintenance Control to procure keys for access to all rooms having locks in order to gain access. Keys may be checked out at the beginning of each work shift by the Contractor and shall be returned to DIA Maintenance Control at the end of each work shift.

#### 1.04 COORDINATION

- A. The Contractor will designate a contact person for coordination with the Project Manager and airline tenants. The contact person shall have the authority to make decisions for the Contractor firm and shall have binding signatory power for changes in work. The contact person shall be on site at all times during work activity.
- B. No additional costs shall be considered for coordination activities throughout this project. The Contractor shall include in his bid costs for coordination of all activities.

#### 1.05 LATE COMPLETION

- A. The Contractor will notify the City as soon as possible, but in no case not less than four weeks in advance, of the inability to meet any of the constraints or milestones. Notification shall be consistent with the requirements of Article 5, General Conditions.

### PART 2 - PRODUCTS (NOT USED)

### PART 3 - EXECUTION

#### 3.01 DUST/PROTECTION BARRIERS

- A. Prior to any demolition the Contractor shall construct area containment doors and dust barriers at five feet outside the limits of demolition of the wall and as directed by the DIA Project Manager. Dust barrier at wall demolition shall be constructed of metal studs with ½” painted gyp board from floor to ceiling. At a minimum, any space containing electrical or telecommunications equipment will require dust barriers for the entire space during demolition and construction. Contractor shall install all required modifications to exit/egress signage until temporary barriers are removed. Contractor shall coordinate location of partition with Fire Sprinkler Contractor to ensure adequate sprinkler coverage during construction. Temporary

barriers shall be removed only after completion of the work scope within the areas including final punch list activities. Areas between ceilings and structure above shall be contained to prevent migration of any dust into adjacent areas.

- B. HVAC system containment. The Contractor shall submit to DIA Maintenance HVAC and Fire Alarm shut down requests prior to modifications to the area of work for dust containment. The HVAC system shall be interrupted, re-routed, or blocked off to prevent dust from entering return or supply ducts.
- C. Debris and Protection Barriers: The Contractor shall construct code-approved and DIA-approved dust and debris barriers on both sides of walls and doors that are to be modified. Barriers shall be constructed to allow emergency ingress and egress to and from equipment and spaces. Barriers shall be constructed to allow continual uninterrupted function of building equipment and spaces.
  - 1. Return all removed door hardware to DIA. Label each hardware set correlating the door number of the original hardware set. Coordinate with the DIA Project Manager representatives for storage and return of hardware.

### **3.02 EQUIPMENT**

- A. Equipment: CNG-powered equipment is allowed within the buildings. No other fossil fuel equipment may be used within the buildings unless the equipment is directly vented to the building exterior.
- B. Electric: Electric powered equipment is acceptable in the Work area.

## **PART 4 -**

## **PART 5 - MEASUREMENT**

### **5.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

## **PART 6 - PAYMENT**

### **6.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item.

**END OF SECTION 01 14 00**

## SECTION 01 14 20

### SECURITY REQUIREMENTS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. Badges and Permits: DIA requires personnel badging and vehicle permitting administered by the Denver International Airport Security Office. The Contractor shall be required to obtain the proper access authorizations for badges and permits, and the Contractor shall immediately report the presence of unauthorized (unbadged) persons or unauthorized (no permit) vehicles on site to the DIA Project Manager.
- B. Fences: If required, the Contractor shall establish and maintain a secure (fenced) perimeter at its primary operations area to include its field offices, staging and storage areas, and maintenance facilities. The responsibility for security within its operations area shall rest solely with the Contractor. Entrance gates to operations areas shall be equipped with a combination of locks to include a lock provided by the City for its use in accessing emergency equipment, should that need arise. The location, size and other physical characteristics of the Contractor's operations area must be approved by the City prior to its installation.
  - 1. Unless specifically required by the Contract Documents and with the exception of the fenced operations area described above, the Contractor shall install no fences or other physical obstructions on or around the project work area without the written approval of the City.
- C. Trash Dumpsters: To provide maximum security for all construction projects in public areas, all trash dumpsters must have the ability to be covered and locked when not in use.
- D. If the contract involves SSI information or procedures, the contractor must contact the Assistant Director of Airport Security or designee, for disclosure information, as well as protocols that must be followed with SSI distribution.

##### 1.02 VENDORS AND SUPPLIERS

- A. The Contractor shall escort ON A FULL TIME BASIS all unbadged vendors and suppliers requiring access to the restricted areas. Only those vendors and suppliers providing materials and/or supplies shall be allowed on site.

##### 1.03 AIRPORT SECURITY PARTICIPANT MANUAL

- A. Contractors are required to obtain an Airport Security Participant Manual from the Airport Security Office and must follow the guidelines in the manual. The Airport Security Participant Manual will be issued after the company has attended a Participant meeting with Airport Security. The Contractor shall comply with the Denver Municipal Airport System Rules and Regulations and TSA regulations.
  - 1. Denver Municipal Airport System Rules and Regulations **Part 130** Movement of Vehicles in the Restricted Area and **Part 20** Security must be adhered to. The Denver Municipal Airport System Rules and Regulations can be found on the flydenver.com website.
  - 2. All work shall be accomplished in accordance with FAA Advisory Circular AC150/5370-2E, "Operational Safety on Airports During Construction", 49 CFR Part 1542 and 14

CFR Part 139 except as modified herein.

3. The following paragraphs supplement, modify, change, delete from or add to FAA AC150/5370-2E. Where any paragraph, subparagraph or clause of the Advisory Circular is modified or deleted by these supplements, the unaltered provisions of that paragraph, subparagraph or clause shall remain in effect.
4. The Transportation Security Administration requires has the authority to issue civil penalties for failure to adhere to their regulations.
5. It is the responsibility of the Airport to ensure all fences and gates are secure. If a Contractor's operations necessitate the frequent use of a particular gate, the Contractor shall place two contract security guards at the gate that shall have been trained and certified by the Operations, Public Safety and Security Division to facilitate access to its work. The Contractor assumes full responsibility for maintaining security once this is done. If the perimeter gate will be used as a haul route, the contractor must also place Haul Route Monitors as dictated by the TSA approved Temporary Amendment. Any fines levied against the Airport as a result of the failure by the Contractor to provide adequate security shall be passed on to the Contractor.
6. Contractors will be required at all times to have a supervisor or foreman at each work location in both restricted and non-restricted areas.

B. Access to Restricted Area via Vehicles

1. The Contractor shall obtain access to the restricted area via a vehicle only when the vehicle displays a valid Vehicle Permit issued by Airport Security (refer to Technical Specifications Section 01016) and the driver has an Airport ID badge with driver authorization.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.01 SUBMITTAL FOR BADGES**

- A. Airport Id badges and vehicle permits shall not be issued prior to Notice to Proceed. The Contractor may at his own risk submit the required information to DIA Maintenance and Engineering Division and to DIA Airport Security prior to Notice to Proceed in order to expedite the badging and permitting process.
- B. By submitting information for the individual requesting or requiring an Airport Id badge that would permit unescorted access to the Sterile and/or Restricted Areas must be fingerprinted and pass a Criminal History Records Check (CHRC) and Security Threat Assessment. Passing a CHRC means the employee shall not have been convicted, given a deferred sentence, found not guilty by reason of insanity or have been arrested and are awaiting judicial proceedings of any felony charge during the ten (10) years before the date of the individual's application for unescorted access authority. For an individual to obtain driver authorization to drive within the Restricted Area, the individual must have a valid driver license that allows them to drive their contractor vehicle.
- C. An employee requesting an Airport ID Badge must resolve all pending or valid violations before being allowed to proceed in the badging process. If the employee no longer works for the company and is attempting to be employed by a different company, a management representative from the "new" company must attend the Violation Notice Hearing along with the employee.



D. Airport ID Badges are obtained as follows:

1. The Contractor shall designate an Authorizing Agent who must attend an annual class with Airport Security. The Authorizing Agent must be an employee of the Contractor, have a valid Denver International Airport ID badge. The Authorizing Agent will be authorized to sign for the Contractor on the Fingerprinting and Badge Application Form and will be the primary designation contact for Airport Security related business.
2. The Contractor shall meet with the DIA Project Manager to review the procedures and required access points at DIA. The Contractor and the Project Manager shall visit the site to verify the access points. Access points shall be listed and submitted by the Contractor to the Project Manager for review and comment prior to Contractor's application for badging.
3. The Contractor's Authorizing Agent shall schedule a Participant Meeting with the DIA Airport Security Office to review DIA security procedures. A second meeting will be scheduled for the Authorizing Agent to learn how to successfully complete the required forms for employee badges and vehicle permits.
4. A CHRC and Security Threat Assessment (STA) are required for each employee requesting unescorted access to the restricted areas. The employee will complete the Fingerprinting and Badge Application (two-sided form) and schedule an appointment with the Airport Security Office to have the form reviewed and to be fingerprinted. The Federal Bureau of Investigation will conduct the CHRC and will return the results to the Airport Security Office. For the fee for the Fingerprinting please see the flydenver.com website. The Transportation Security Administration will process the STA and will return the results to the Airport Security Office.
5. When the Authorizing Agent is notified by Airport Security that the CHRC and STA has cleared, the individual shall call the Airport Security Office, to schedule an appointment to come to the Airport Security Office to receive regulated security and driver training. The appointment will take approximately one hour for security training and approximately two hours for security and driver training.
6. All applicants will must watch and pass all concepts of a computer based security training module for a SIDA Airport ID badge. All individuals requesting driver authorization in the non movement area must also view an interactive computer based driver training module and complete a test by passing all concepts. In addition the individual must receive non movement driver orientation training by the Contractor's driver representative before being allowed to drive on the airfield. Non Movement Orientation training should be conducted annually.
7. **ALL EMPLOYEES ARE REQUIRED TO HAVE AN AIRPORT ID BADGE.** The Contractor is advised that there is a \$10 dollar processing fee for every issued Airport ID badge. Rebadging fee is \$10.00.
8. The Airport ID badges must be returned to the Airport Security Office prior to final payment. All Airport ID badges are issued with an annual expiration date. The expiration date is determined by either the end of the estimated project date or the expiration of the vehicle insurance, whichever ever date is closer. Contractors shall notify the Project Manager as soon as possible but in no case less than four weeks in advance of any requirement to extend the duration of badge validations.
9. Total fees for startup:
  - \$ 40 Criminal History Records Check (per employee) for Unescorted access.
  - \$ 10.00 Badge (per employee)

**3.02 DUMPSTERS**

A. Security Requirements: The following procedures must be followed to provide maximum

security with all construction projects in public areas:

1. Roll-off dumpsters must have the ability to be covered (hard side) and locked when not in use.
2. When unlocked and in use, the Contractor shall provide an employee, or a subcontractor's employee, to stand by the dumpster to prevent unauthorized placement of prohibited items.
3. If the Contractor is not able to have a roll-off dumpster with the ability to be locked, the dumpster shall be removed from the public area when the construction site is inactive.

#### **PART 4 - MEASUREMENT**

##### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

#### **PART 5 - PAYMENT**

##### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item.

**END OF SECTION 01 14 20**

## SECTION 01 29 10

### SCHEDULE OF VALUES

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. The Work specified in this Section consists of preparing and submitting the Schedule of Values ("Schedule") as referenced in the General Conditions. The Schedule will be built upon a breakdown of the Work using specification sections and milestones. The Work also includes the preparing and submitting of updated copies of the Schedule if the Schedule is affected by change orders.
- B. A Schedule of Stored Material is a detailed cost breakdown for permanent materials that will be temporarily stored prior to their being installed and for which the Contractor seeks partial payments. The Schedule of Stored Material will be incorporated as a part of the Schedule of Values.
- C. Within 14 calendar days of issuance of the Notice to Proceed, the Contractor shall submit the Schedule of Values including the Schedule of Stored Material if applicable. The Schedule of Values and Schedule of Stored Material used to prepare the work/cost breakdown for the Schedule will be used for the Contractor's billings.
- D. Any contract allowances shall be included in the Schedule. Expenditure of allowances shall be done through the use of the Allowance Authorization form. Use of this form does not increase or decrease the contract value.

##### 1.02 RELATED DOCUMENTS

- A. General Contract Conditions, Title 9 Compensation
- B. Technical Specifications Section 01 33 00 Submittals
- C. Technical Specifications Section 01 33 25 Shop and Working Drawings, Product Data and Samples
- D. Technical Specifications Section 01 99 90 Standard Forms, CM 89, CM 90 and CM 91 as applicable for the project.

##### 1.03 SUBMITTAL

- A. The Schedule shall be submitted in a format approved by the PMT/DIA Project Manager.
- B. The Schedule shall identify each item of work. Work items in the Schedule shall represent all work and shall be referenced with the Technical Specifications section numbers, specification subparagraph, specification section title and the bid item number used for the Schedule of Prices and Quantities when applicable. The Schedule shall address the subcontractor, fabricator or supplier furnishing the materials and or labor for each work item.
- C. Upon request by the City, the Contractor shall support values given with the data which will substantiate the correctness of the values.

- D. The Schedule will be utilized only as a basis for review of the Contractor's application for progress payment.

#### **1.04 REVIEW AND RESUBMITTAL**

- A. If review by the City indicates that changes to the Schedule are required, the Contractor shall revise and resubmit the Schedule.

### **PART 2 - PRODUCTS (NOT USED)**

### **PART 3 - EXECUTION**

#### **3.01 PREPARING SCHEDULE OF VALUES**

- A. Breakdown of the items used in the Schedule shall include costs as follows:
  - 1. Delivered cost of product with applicable taxes paid
  - 2. Total installation cost with overhead and profit
  - 3. Breakdown costs of each lump sum item with a list of products and major operations for which the Contractor seeks to receive progress payments to recover his costs for that bid item
  - 4. Each unit price item as listed in the bid Schedule of Prices and Quantities shall list products and major operations for which the Contractor seeks to receive progress payments for that bid item.

#### **3.02 PREPARING SCHEDULE OF STORED MATERIAL**

- A. The Contractor shall submit with the Schedule an indication of whether products will be stored on or off the worksite. The Schedule of Stored Material shall show quantities and types of products that will be stored.
- B. Material allowances consist of only the net cost of the product, the cost of delivery and unloading at the storage site, the cost of applicable sales taxes and all discounts.
- C. In no case will the cost paid for a permanent material be greater than 90 percent of the contract price for the work in which they are included.

#### **3.03 PAYMENT FOR STORED MATERIALS**

- A. Only materials that are described in the specifications and on the drawings will be considered permanent materials. Permanent materials are materials that will be left in the work after the contract is completed.
- B. Nothing in these specifications shall be interpreted as requiring the City to pay for stored materials. The Project Manager shall decide on a case-by-case basis whether stored materials shall be paid for. No payment will be made for stored materials which have not been submitted and accepted.
- C. The Contractor must, at all times, store permanent materials in accordance with manufacturer's recommendations. Any material not properly stored will not be paid for. Amounts will be deducted from payments for any stored permanent material previously paid for and subsequently found to be improperly stored or not present, based upon a physical inventory of stored permanent material.

- D. Only the neat line quantity of material needed for the finished product may be paid for.
- E. All requests for stored permanent material payment must be accompanied by paid invoices clearly showing the quantity of permanent material, the type of permanent material and discounts or rebates and the net amount paid to the supplier along with a certificate stating that the permanent material is free of any liens or judgments preventing its use by the City.
- F. If the permanent material is stored outside the Denver area the Contractor must pay for the City representative's transportation and lodging to see the stored material as needed. Acceptable lodgings must, as a minimum, have a Mobil Travel Guide Rating Criteria® rating of Two-Star or the American Automobile Association Lodging Listing Requirements & Diamond Rating Guidelines® rating of Two Diamonds. The minimum transportation shall be by regularly scheduled commercial air carrier at coach rates. The Project Manager will determine if an overnight stay is required.
- G. All permanent material stored off site, for which payment is being requested must be insured and stored in bonded, insured warehouses.
- H. Any permanent material on which payment is requested must be in such a form that it cannot be used on work other than this contract, or stored in a manner acceptable to the Project Manager to ensure that the permanent material cannot be used on work other than this contract.

### **3.04 ALLOWANCE AUTHORIZATION AND PAYMENT**

- A. Contractor shall request written approval for expenditure of any contract allowances PRIOR TO performing the Work involved. List work to be performed and estimated cost in the requesting correspondence.
- B. Original copies of all invoices and receipts must be submitted with the Allowance Authorization as part of the request for payment.
- C. Using the format provided by the City, the Contractor's request for payment of all contract allowances shall be included in the Schedule of Values.

## **PART 4 - MEASUREMENT**

### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

## **PART 5 - PAYMENT**

### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item.

**END OF SECTION 01 29 10**

## SECTION 01 31 00

### PROJECT MANAGEMENT AND COORDINATION

#### PART 1 - GENERAL

- A. Work specified in this Section includes coordination efforts which must be provided by the Contractor to ensure that work by others in the contract designated work area and adjacent areas does not negatively impact the Work and overall project.
- B. The construction schedule as specified in Technical Specifications Section 01 32 19 shall reflect all interfaces and coordination efforts as specified in General Condition 701, Special Condition SC-6, Technical Specification Sections 01 11 00, 01 14 00, 01 31 00, and 01 75 15, and other related contracts and procurement documents.
- C. The Contractor will establish regular working relations with all contractors, tenants and the Airport Maintenance Department working in the same area and areas adjacent to the construction site. The Contractor will attend construction progress meetings as described in Technical Specification Section 01 31 19 and will coordinate work as described therein.
- D. The Contractor will assign a member of his staff to act as a coordinator, who will work to coordinate the Contractor's work with other parties doing work at the Denver International Airport site.

#### 1.02 WORK INCLUDED

#### 1.03 CONTRACTOR'S RESPONSIBILITIES

#### 1.04 COORDINATION WITH OTHER PROJECTS

#### 1.05 METHOD OF MEASUREMENT

#### 1.06 METHOD OF PAYMENT

- A. Minimum cooperation requirements with other contractors include the following:
  - 1. Regular meeting (weekly or more often)
  - 2. Construction schedule coordination
  - 3. Staging area and access planning (to include employee shuttle routes)
  - 4. Deliveries
  - 5. Traffic control.
- B. When and where required, the Contractor shall develop appropriate coordination drawings for use by interfacing adjacent parties using the Denver International Airport site.
- C. The following is a list that includes, but is not limited to all of the contractors that will be working in the area of the project limits: DIA project manager needs to complete list below.
  - 1. TBD

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**PART 4 - MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item.

**END OF SECTION 01 31 00**

## SECTION 01 31 19

### PROJECT MEETINGS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. The Work specified in this Section requires the Contractor's superintendent and Quality Control representative to attend meetings scheduled by the City for the collection and dissemination of information related to the subject contract.
- B. The Project Manager will prepare the minutes of each meeting and distribute them to each of the participants.

##### 1.02 OTHER MEETINGS

- A. The Contractor will be advised of times, dates and places of contract meetings.

#### PART 2 - PRODUCTS (NOT USED)

#### PART 3 - EXECUTION

##### 3.01 PRECONSTRUCTION MEETING

- A. A Preconstruction Meeting will be scheduled by the City after the Contract has been signed by all parties. The purpose of this meeting is to introduce the City's Representatives to their counterparts in the Contractor's organization and to establish lines of communication between these representatives and outline some contract requirements. The Contractor's Superintendent and Quality Control Representative(s) shall attend this meeting.
- B. The Project Manager will distribute a notice of this meeting, along with an agenda of the subjects to be addressed.
- C. The Project Manager will explain and discuss the responsibilities and authorities of the City, the Designer, and the Project Manager's organization.
- D. The Project Manager will provide highlights of the following information at this meeting:
  - 1. Equal Employment Opportunity (EEO), Minority Business Enterprise (MBE) and Women Business Enterprise (WBE) requirements.
  - 2. Insurance, laws, codes, traffic regulations and permit requirements of public agencies and their regulations.
  - 3. Procedures for processing change orders.
  - 4. Procedures for submitting shop and working drawings, product data and samples.
  - 5. Monthly pay estimate cutoff dates.
  - 6. Payment procedures.
  - 7. Request for information procedures.
  - 8. Communication procedures.
  - 9. Contractor-required Daily Report showing the quantitative progress of work, the use of



men, material and equipment, problems, potential delays, weather, shift, down equipment, material and equipment received and information received from the City. Daily reports will be submitted to the Project Manager within 48 hours of start of work. Daily Reports are required every day, including weekends and holidays.

10. Scheduling and coordination requirements.
  11. Quality control/assurance procedures.
  12. Environmental requirements and permits.
  13. As-built documents.
  14. Project closeout requirements.
- E. The Contractor will introduce the Contractor's representatives and briefly describe each person's responsibilities. The Contractor will provide the following:
1. A list of all subcontractors.
  2. Office, storage areas and construction area layouts, along with temporary easements.
  3. Safety, first aid, emergency actions and security procedures including the name of the Contractor's insurance company.
  4. 60 day preliminary schedule.
  5. Sequence of Work.
  6. Construction methods and general worksite layout and haul plan.
  7. Housekeeping procedures. Include a written plan for dealing with and preventing FOD (Foreign Object Damage).
  8. The Contractor's general erosion and sedimentation control plans, noise, hazardous material, air and water pollution control plans and Quality Control Plan.
  9. Coordination and notification for utility work.
  10. The Contractor's procedures to coordinate its work with the work of other contractors and its procedures for sharing access to the worksite.
  11. Deliveries and priorities of major equipment.
  12. Submittal Schedule
- F. Explanations provided by the City will not amend, supersede or alter the terms or meaning of any contract documents, and the Contractor shall not claim reliance on such explanations as a defense to any breach or failure by the Contractor to perform as specified in the contract.

### **3.02 CONSTRUCTION PROGRESS MEETINGS**

- A. Progress meetings will be scheduled weekly and more often as necessary by the Project Manager to promote the competent and timely execution of the contract.
- B. The meetings will be held at the worksite or at a location selected by the Project Manager. Meetings will be chaired by the Project Manager or the Project Manager's representative.
- C. The Contractor's personnel, as listed in Technical Specification Section 01 31 19, 3.01.A, shall attend unless otherwise agreed by the Project Manager.
- D. The Project Manager will be responsible for publishing minutes of the meetings.

- E. At a minimum, the following items will be addressed at each meeting. The items addressed in the meeting do not waive notification or submittal requirements as required elsewhere in the contract.
1. Safety: Contractor shall report any safety issues
  2. Quality Control
    - a. The Contractor's Quality Control representative shall present and review all RAR's, CCR's, and NCR's issued and the status of each item.
    - b. The Contractor's Quality Control Representative shall present and discuss the Independent Testing Agency weekly test report and/or testing schedule.
    - c. The Contractor's Quality Control representative shall report on inspections by other agencies and any follow-up activity required.
    - d. The Project Manager will present and discuss issues regarding quality control.
  3. Quality Assurance
    - a. The Project Manager will present and discuss issues regarding quality assurance.
  4. Design activities: open discussion
  5. Shop drawings/submittals
    - a. The Contractor shall provide four copies of and review the Contractor's submittal schedule and provide any updated information and/or changes to the schedule.
    - b. The Contractor shall provide information on the status of submittals requiring re-submittal.
    - c. The Contractor shall review any accepted submittals that the Contractor plans to re-submit with changes.
  6. Construction activities: Open discussion to include coordination items with other Contractors and or agencies.
  7. Schedule
    - a. The Contractor shall provide to the Project Manager four copies of the Contractor's three week look-ahead schedule and review at the meeting the items on the schedule. The schedule shall be in bar chart format based on the approved CPM, and shall include dates of testing activities, anticipated dates of inspection by DIA and other agencies, items in progress, percentage of completion of items, responsible subcontractor for the items.

#### **PART 4 - MEASUREMENT**

##### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

#### **PART 5 - PAYMENT**

##### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable multiplier or work request bid item.

**END OF SECTION 01 31 19**

## SECTION 013200 - SCHEDULE

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section includes administrative and procedural requirements for planning and documenting the progress of construction during performance of the Work, including the following:

1. Preliminary construction schedule.
2. Contractor's construction schedule.
3. Contractor's monthly construction schedule update.
4. As-built schedule
5. Three week look-ahead schedule
6. Daily construction reports.
7. Submittal schedule
8. Fabrication schedules
9. Material delivery schedules, cranes, special equipments and staging status
10. Special reports.
  - a. Weather impacts and mitigations
  - b. Recovery Schedule and alternatives.

- B. Related Requirements:

1. Section 011200 "Multiple Contract Summary" for preparing a combined Contractor's construction schedule.
2. Section 013300 "Submittal Procedures" for submitting schedules and reports.
3. Section 0143 10, 01 43 20, 01 45 10, 01 45 20, 01 45 25 and 01 45 45. "Quality Requirements and inspection" for submitting a schedule of tests and inspections.
4. Section 01 29 10 Schedule of Values.
5. Section 01 14 20 Work Sequence and Constraints

#### 1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

- B. Cost Loading: The allocation of the schedule of values for the completion of an activity or group of activities bundled in hammock or codes under a WBS unit as scheduled. The sum of costs

for all activities or WBS must equal the total Contract Sum unless otherwise approved by DIA Project Manager. All costs shall be accounted for in the schedule and shall be balanced to where no activity can be unfunded in the project budget. The cost loading at any level acceptable to DIA Project control group shall not relieve the Contractor of its obligation to fund all necessary work to complete the project.

- C. CPM: Critical Path Method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.
- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Float: The measure of leeway in starting and completing an activity.
  - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
  - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
  - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- F. Resource Loading: The allocation of direct man hours and equipment necessary for the completion of an activity as scheduled. The contractor shall account for the indirect man hours in the cost. The indirect labor hours could be tracked and reported separately if agreed upon between The Contractor and the DIA project control group.
- G. Direct man hours: Man hours related only to the physical construction of the work (i.e. masonry, mechanical, electrical, drywall, carpeting, etc.)
- H. Indirect man hours: Man hours related to support of the physical construction of the work (i.e. cleanup, mobilization, traffic control, temporary activities, badging, supervision and overhead etc.)
- I. WBS: Work Breakdown Structure. A hierarchical arrangement of the schedule activities which allows for roll-up and summarization to a predetermined level. The sum of all the WBS must equal all the contract scope of work including any temporary items necessary to deliver complete operational system in the time established for each mile stone or project work. WBS must equal or exceed the Schedule of Value line items broken by discipline and measureable units. The WBS system shall be only broken down to a manageable count. The level of breakdown shall be established jointly between DIA Project control team and the CM/GC project control staff. In the absence of a timely agreement the DIA Project Manager shall have control of the time and progress payment until an acceptable schedule is accepted.
- J. Stored Material schedule all material intended to be paid as stored material shall be separated as progress activities and cost loaded as agreed upon by the DIA project manager and as permissible by The Contract (no markups or profits, insured, inspected and paid).

#### 1.4 SUBMITTALS

- A. Coordinate a meeting with DIA scheduling group to address the level of details and the structures necessary to produce a schedule that is accurate, practical and valid provide the following information:
1. Meet the intent of the Contract term, milestones and coordinate the work to be performed in the most efficient manner.
  2. Provide a proper planning tool to evaluate the progress of the work and assure the proper resources has been committed to meet the intent of the contract document on time, cost and quality and minimize the disruption of airport operation.
  3. Ability to evaluate the impact of future changes on the completion of the contract.
  4. Ability to mitigate and reduce the impacts of changes regardless of the cause of those changes and delay impacts.
  5. Ability to allocate causes and provide clear responsibility of delays and recoveries for the benefit of a successful completion of the project.
- B. Format for Submittals: Submit required submittals in the following format:
1. The contractor shall generate a computerized Critical Path Method (CPM) schedule for the work utilizing the Precedence Diagram Method (PDM) in Gantt chart view.
  2. The schedule shall be submitted to the project manager electronically in PDF format and on a CD in dynamic format which will allow manipulation and generation of report to evaluate and review any part of the schedule.
  3. Preliminary and Construction Schedule formats shall contain a title block showing:
    - a. Contractor's name.
    - b. Contract number and title
    - c. Data date
    - d. Symbol definitions
  4. Schedules shall contain a time line at the top
  5. The Activity table (Layout) shall include at a minimum the following columns:
    - a. Activity ID
    - b. Activity name
    - c. Original duration
    - d. Schedule % complete
    - e. Start
    - f. Finish
    - g. Total Float
  6. A report shall accompany all schedules containing a list of all approved changes to the original approved (baseline) schedule.
  7. A mitigation report shall be required when at the discretion of either party it become apparent that the project is not progressing on time regardless of the cause of delays and impacts, or issued construction changes has negative impact and require a mitigation effort through several viable alternatives.
- C. Preliminary construction schedule.
1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule and date on label.
  2. Approval of preliminary construction schedule will not constitute approval of schedule of values for cost-loaded activities.
  3. Submit schedule at preconstruction meeting.
  4. City will respond within 14 days with acceptance or direction to revise and resubmit.

**D. Contractor's Construction Schedule:**

1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
2. Submit schedule within 30 days after Notice to Proceed.
3. City will respond within 14 days with acceptance or direction to revise and resubmit.
4. Failure of the contractor to have a construction schedule approved by the City will be considered cause for withholding progress payment.
5. The acceptance of the schedule is for general conformity to the contract requirements and shall not constitute any relief of any contract requirements

**E. Construction Schedule Monthly Updates:**

1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.
2. Submit schedule with Pay Application.
3. City will respond within 14 days with acceptance or direction to revise and resubmit.
4. Submit request for construction schedule changes with narrative.
5. Failure of the contractor to have a construction schedule approved by the City will be considered cause for withholding progress payment.

**F. As-built Construction Schedule:**

1. After all contract work items are complete, the contractor shall submit an as-built construction schedule showing actual start and finish dates for all work items and milestones.

**1.5 QUALITY ASSURANCE**

**A. Scheduling Consultant Qualifications:** An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Project Manager's request.

**B. Pre-scheduling Conference:** Conduct conference at pre-bid meeting to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the set-up in P6 of preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:

1. Review content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including phasing, area separations, interim milestones and partial Owner occupancy.
4. Review delivery dates for Owner-furnished products.
5. Review submittal requirements and procedures.
6. Review time required for review of submittals and resubmittals.
7. Review requirements for tests and inspections by independent testing and inspecting agencies.
8. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
9. Review procedures for updating schedule.
10. Review requirements for content and input of direct man hour resources in activities.

11. Review requirements for cost loading of activities.

## 1.6 COORDINATION

- A. Coordinate Contractor's construction schedule with the schedule of values (deleted).
  1. Work items in the construction schedule shall be identified in a Work Breakdown Structure (WBS) format that corresponds with the technical specifications.
  2. At a minimum WBS shall correspond to the first tier level of the Master Format.
  3. Secure time commitments for performing critical elements of the Work from entities involved.
  4. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

## PART 2 - PRODUCTS

### 2.1 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

- A. Time Frame: Extend schedule from dates established for the Notice to Proceed to date of Substantial Completion and final completion.
  1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
  1. Activity Duration: Define activities so no field activity is longer than 20 days, unless specifically allowed by project manager.
  2. Critical Path Activities: No more than 25 percent of the activities may be on the critical path.
  3. Procurement Activities: Include procurement process activities for the following long lead items and major items as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
  4. Submittal Review Time: Include review and re-submittal times indicated in Section 013300 "Submittal Procedures" in schedule unless time frame reduced by approval of project manager. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
  5. Startup and Testing Time: Include adequate days for startup and testing.
  6. Substantial Completion: Indicate date established for Substantial Completion.
  7. Punch List and Final Completion: Include days for completion of punch list items and final completion.
  8. Failure to include any work item required for performance of this contract shall not excuse the contractor from completing all work within applicable completion dates, regardless of the City's approval of the schedule.
- C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
  1. Phasing: Arrange list of activities on schedule by phase.

2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
  3. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
  4. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
- D. Milestones: Include milestone indicated in the contract documents in schedule, including, but not limited to, the Notice to Proceed, phasing requirements, Substantial Completion and final completion.
- E. Three Week Look-ahead Schedule: The Contractor shall provide to the Project Manager four copies of the Contractor's three week look-ahead schedule and review at the Project Manager's weekly progress meeting. The schedule shall be in bar chart format based on the approved CPM, and shall include dates of testing activities, anticipated dates of inspection by DIA and other agencies, items in progress, percentage of completion of items and responsible subcontractor for the items.
- F. Recovery Schedule:
1. If the latest completion time for any work item does not fall within the time allowed by the construction schedule, the sequence of work and/or durations shall be revised by the contractor through concurrent operations, additional manpower, additional shifts or overtime, additional equipment, or alternative construction methods until the schedule produced indicates that all significant contract completion dates, occupancy dates and milestones will be met. No additional costs will be allowed if such expediting measures are necessary to meet the agreed completion date or dates except as provided elsewhere in the contract documents.
  - 2.
  3. When periodic update indicates the Work is behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule.
  4. Provide narrative indicating changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished. Narrative shall be submitted in accordance with the General Conditions Title 1105 on changes in time.
- G. Contract Extensions:
1. If the Contractor is granted an extension of time for completion of any milestone or contract completion date under the provisions of the contract, the determination of the total number of extended days will be based upon the current analysis of the schedule and upon all data relevant to the extension. Such data shall be incorporated into the next monthly update of the schedule.
  2. The Contractor acknowledges and agrees that delays in work items which, according to schedule analysis, do not affect any milestone dates or the contract completion date shown on the CPM network at the time of the delay will not be the basis for a contract extension.
- H. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.



1. Use Primavera Contractor or P6 operating system.

- I. Schedule Narratives: In addition to the schedule the contractor shall submit a narrative that explains the basis for the Contractor's determination of construction logic. It shall include estimated quantities and production rates, hours per shift, work days per week, and types, number and capacities of major construction equipment to be used and whether the Contractor plans to work weekends or holidays
- J. Subcontractor Coordination: The Contractor shall schedule and coordinate the work of all of its subcontractors and suppliers including their use of the worksite. The Contractor shall keep the subcontractors and suppliers informed of the project construction schedule to enable the subcontractors and suppliers to plan and perform their work properly.
- K. Failure to Submit Required Schedules: Failure of the Contractor to have a construction schedule approved by the City will be considered cause for withholding progress payment(s).

## 2.2 PRELIMINARY CONSTRUCTION SCHEDULE

- A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type CPM construction schedule at the preconstruction meeting.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first **60** days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities. The preliminary schedule shall show all significant work tasks that occur in the first 60 days, including planning, mobilization, shop submittals and approval time, procurement, fabrication and construction. It shall identify work items or milestones that affect or are affected by the City, other Contractor's work, utilities and other third parties and it shall list major data submittals required by the contract.
- C. Narrative: The preliminary schedule shall be accompanied by a narrative describing the Contractor's approach to mobilization, procurement and construction during the first 60 days. The narrative shall elaborate on the basis of durations, production rates, and major equipment to be used, and shall identify all major assumptions used to develop the schedule.
- D. In lieu of the preliminary schedule the Contractor may at his own discretion submit the Construction Schedule at the Preconstruction Meeting. If the Construction Schedule is submitted in lieu of the Preliminary Schedule, the City will respond within 30 days with acceptance or direction to revise and resubmit within 10 days.

## 2.3 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work.
  - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
    - a. Preparation and processing of submittals.
    - b. Mobilization and demobilization.
    - c. Purchase of materials.
    - d. Delivery.
    - e. Fabrication.

- f. Utility interruptions.
  - g. Installation.
  - h. Work by the City, other contractors, utilities and other third parties that may affect or be affected by Contractor's activities.
  - i. Testing and commissioning.
  - j. Punch list and final completion.
2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
3. Cost and Resource-Loading of CPM Schedule:
  - a. Assign cost to construction activities on the CPM schedule.
  - b. Each activity cost shall reflect an appropriate value subject to approval by Project Manager.
  - c. Total cost assigned to activities shall equal the total Contract Sum.
  - d. Activities shall be resource loaded with direct man hours required to perform physical construction of the work. Indirect man hours shall not be included as resources in activities.
- B. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis to demonstrate the effect of the proposed change on the overall project schedule.
- C. Schedule Updating:
  1. The contractor shall submit a monthly progress report at the end of each month following the Notice to Proceed. At the end of each month, the Contractor and Project Manager shall agree on the progress of the work and the Contractor shall update the construction schedule accordingly. The updated construction schedule is a prerequisite to the submittal of the Contractor's application for progress payment. The schedule shall be made in accordance with Technical Specifications Section 01310-3.02. This review does not constitute an approval of the construction schedule and shall not be used for the purposes of modifying the initially approved construction schedule.
  2. The contractor's monthly progress report shall include a written narrative describing the overall progress of the work, provide a critical path analysis, discuss significant problems with proposed corrective action, and how the status of major changes and any other changes in sequence of the work.
  3. Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
    - a. Identification of activities that have changed.
    - b. Changes in early and late start dates.
    - c. Changes in early and late finish dates.
    - d. Changes in activity durations in workdays.
    - e. Changes in the critical path.
    - f. Changes in total float or slack time.
    - g. Changes in the Contract Time.
  4. Changes to the Schedule: The construction schedule may be changed when one or more of the following occur.
    - a. When a change or order significantly affects the contract completion date or sequence of work items.
    - b. When the contractor elects to change the sequence or duration of work items affecting the critical path.

- c. When the City directs a change that affects a milestone date(s) specified in the Special Conditions or alters the length of a critical path.
5. Minor revisions submitted at monthly progress review meetings are not considered as changes in this context.
6. If, after submitting a request for change to the construction schedule, the Project Manager does not agree with the request, the Project Manager will schedule a meeting with the Contractor to discuss the differences. If a settlement cannot be reached on the change in the construction schedule or if the Contractor has failed to submit revisions to the network, the Project Manager has the option of providing suggested logic and/or duration times in all subsequent updating reports. The suggested logic and/or duration times will remain in effect until the change in the construction schedule is settled or until the logic and duration are superseded.
  - a. If the Contractor has any objections to the data furnished by the Project Manager, he shall advise the Project Manager within ten days in writing, fully supporting the objections with a counter plan. The revisions suggested by the Project Manager shall be used for updating reports until the Project Manager approves the counter plan.
  - b. If the Contractor does not submit a counter plan and data within ten days after the date of the Project Manager's suggested logic, the Contractor is deemed to have concurred with the Project Manager's suggested logic/duration time changes. The Project Manager's plan will be the basis of negotiations for any adjustment of the time and cost for performance of the Work.
  - c. Insert articles for other schedules and lists to suit Project, depending on complexity.

## PART 3 - EXECUTION

### 3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.
  1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
  2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule with each monthly payment application.
  1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.

2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate final completion percentage for each activity.

END OF SECTION 013200

**ALL ENGINEER NOTES SHALL BE DELETED FROM THE FILE OR MARKED AS HIDDEN.**

## SECTION 01 32 23

### LAYOUT OF WORK AND SURVEYS

**THIS SECTION INCLUDES GENERAL REQUIREMENTS FOR THE PROCEDURES AND ACCURACY REQUIREMENTS FOR SURVEY SERVICES FOR LAYOUT OF WORK AND FIELD MEASUREMENT OF WORK QUANTITIES DETERMINED...**

#### ACRONYMS

AC	Advisory Circular
AGIS	Airport Geographic Information System (FAA's Database)
ANSI	American National Standards Institute
CADD	Computer Aided Design and Drafting
CCD	City and County of Denver
DIA	Denver International Airport
DIA LDP	Denver International Airport Low Distortion Projection Coordinate System
eALP	Electronic Airport Layout Plan
EDS	Engineering Data System
EGIS	Enterprise Geographic Information System (DIA's Database)
ESRI	Environmental Systems Research Institute
ESV	Engineering Spatial Viewer
FAA	Federal Aviation Administration
GIS	Geographic Information System
HDS	High Definition Scanning
ILS	Instrument Landing System
PACS	Primary Airport Control Station
P&D	Planning and Development
QA	Quality Assurance
QC	Quality Control
SACS	Secondary Airport Control Stations
SDSFIE	Spatial Data Standards For Facilities, Infrastructure and Environment
WMX	ArcGIS Workflow Manager
XML	Extensible Markup Language

#### PART 1 - GENERAL

##### 1.01 SCOPE

- A. This Section covers the procedures and accuracy requirements for survey services for layout of work, as-built surveys, and field measurement of work quantities to be determined by surveys.
- B. Before commencing any layout of work and surveys the Contractor shall give the Project Manager 48 hours written advance notice so that the Project Manager may witness such work. Contact the Airport Survey Office: Dennis Hamlin, PLS DIA Land Surveyor Supervisor (Airport Survey Manager), DIA Airport Survey Office, 303-342-4428 or email: Dennis.Hamlin@flydenver.com. Contractors are responsible for obtaining DIA related survey guidance, survey points, calibration files and training materials from the Airport Survey Office prior to beginning survey work on any DIA project regardless of size, scope or duration.
- C. Reference Contract General Conditions, GC 317 and GC 318.

- D. All construction as-built surveys shall comply with Federal Aviation Administration Advisory Circulars when applicable and designated by the DIA Project Manager in the Technical Specifications for the awarded project:
1. AC 150/5300-13 “*Airport Design*”
  2. AC 150/5300-16A “*General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey.*”
  3. AC 150/5300-17C “*General Guidance and Specifications for Aeronautical Surveys: Airport Imagery Acquisition and Submission to the National Geodetic Survey.*”
  4. AC 150/5300-18B “*General Guidance and Specifications for Aeronautical Surveys: Airport Survey Data Collection and Geographic Information System Standards.*”
- E. FAA and Airport electronic data submission requirements were condensed into airport specific standards that are applicable to both construction and design data. Surveys are a subset of electronic data and require post processing using the following DIA Standards for Electronic Data:
1. DIA Design Standards Manual 12: *Chapter 2 – CADD Template.*
  2. DIA Design Standards Manual 12: *Chapter 3 – GIS Data Standards.*
  3. DIA Design Standards Manual 12: *Chapter 5 – Existing Subsurface Utilities Data Standards*
  4. DIA Design Standards Manual 12: *Chapter 6 – Metadata Standards*
  5. *DIA Design Standards Manual 12: Chapter 7 – GIS/CADD Data Submittal Requirements*

**EDIT THIS SECTION BELOW AS NEEDED BASED ON THE REQUIREMENTS OF THE PROJECT. ENGINEER SHALL NOT REDUCE THE REQUIREMENTS BELOW WITHOUT PERMISSION FROM THE DIA PROJECT MANAGER.**

## 1.02 SUBMITTALS

- A. Refer to Technical Specifications Sections 01300 and 01340 for the submittal process. **Items B-L in this section are to be filled out by Contractor when stipulated by your DIA Project Manager based on a case-by-case determination depending on project location, project scope, and project impact to the electronic Airport Layout Plan. These various submittal documents are not mandatory unless stated so by the DIA Project Manager overseeing the project bid proposal prior to project award. These additional submittal requirements are found in Subpart Part 4-FAA Mandated Reporting Requirements.**
1. Copies of original pages of field notes.
  2. Original field notebooks when filled and at end of contract.
- B. The Contractor shall submit drawing data at each submittal to the City in either CADD or GIS formats including **all attribute information** so that proper attribution may occur for a final GIS deliverable for use by airport staff in facility management. GIS/CADD drawing submittals shall adhere to the standards set forth in document DSM 12 *Chapter 7 CADD-GIS Data Submittal Requirements*.
- C. 30% as-built data in both CADD or GIS formats including all attribute information and metadata
- D. 60% as-built data in both CADD or GIS formats including all attribute information and metadata (if required by DIA PM)

- E. 90% as-built data in both CADD or GIS formats including all attribute information and metadata (if required by DIA PM)
- F. Final as-built data in both CADD or GIS formats including all attribute information and metadata

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - SURVEY CONTROL

### 3.01 GEODETIC CONTROL

- A. All airport construction project surveys must tie to DIA LDP, a Low Distortion Projection for Denver International Airport (KDEN). DIA LDP provides Geodetic Control for establishing DIA Airport Survey Control points in DIA LDP for all survey, planning, design, construction and engineering work conducted on Airport property. Denver International Airport utilized a coordinate system called DIA Grid coordinate system prior to August 1, 2011. Drawings may be found in the legacy coordinate system; however, these drawings can be used for reference purposes only unless specifically stated otherwise by the Denver International Airport Project Manager. Surveys must not utilize DIA Grid coordinate system for placing construction stakes or for collecting construction as-built information. All construction survey as-built data must be collected in DIA LDP regardless of special circumstances which allowed design and construction stake surveys to be conducted in the previous DIA GRID coordinate system. DIA GRID is now a legacy coordinate system referenced here as historical. All of DIA Airport Control Points are cataloged at [www.ngs.noaa.gov](http://www.ngs.noaa.gov) website. The Airport Survey Office can provide coordinates of the Airport Control points in DIA LDP based upon the project site location. The Airport Survey Office is your primary point of contact for any questions regarding the Airport's use of DIA LDP.
- B. Report damaged or destroyed airport control points, bench marks, and section corner monuments to the Project Manager.
  - 1. If section corner monuments are damaged or destroyed during construction activities, such points shall be re-established pursuant to "Laws of the State of Colorado Regulating the Practice of Land Surveying" by a Professional Land Surveyor registered in the State of Colorado.
  - 2. If airport control points or bench marks are damaged, moved, altered or destroyed by the Contractor, the City's cost of reestablishing such points shall be borne by the Contractor.
  - 3. The City will not be responsible for any increased costs or delays to the Contractor relating to reference points, airport control points, or bench marks which are damaged, moved, altered or destroyed by the Contractor or its subcontractors, suppliers, agents or employees or other Contractors working on the site.
- C. Report alleged errors in reference points, airport control points, or bench marks promptly to the Project Manager.
  - 1. Discontinue use of reference points, airport control points, or bench marks alleged to be in error until the accuracy of points can be verified or as directed.
  - 2. Claims for extra compensation for alteration or reconstruction allegedly due to errors in reference points, airport control points, or benchmarks will not be allowed unless original reference points, airport points and benchmarks still exist or substantiating evidence proving error is furnished by the Contractor, and unless the Contractor has reported such errors to the Project Manager as specified herein.

- D. The following are limitations and additional information on reference points, airport control points and benchmarks:
1. The use of control monuments and GPS calibration files for construction surveying other than those shown on the contract drawings or furnished by or approved by the Airport Survey Office is strictly prohibited. Use of other monuments is at the Contractor's sole risk.
  2. The DIA Airport Control Points include NAVD 88 elevations and LDP horizontal coordinate data. These values as listed on the contract drawings or listed in the specifications are the only approved coordinate points and elevations for construction surveying.
  3. The use of control monuments for construction surveying other than those shown on the contract drawings or furnished by the Airport Survey Office is prohibited. Use of other monuments is at the Contractor's sole risk.
  4. Elevations are based upon mean sea level datum from several NGS Class 2 benchmarks, which were accessed from areas outside of DIA to establish a NAVD88 Vertical Datum at DIA., in Jan. 2007 (1st order Class 2 elevations) by Woolpert, Inc and have been accepted by the Airport for use in Construction Surveys.
  5. The X, Y, Z data listed on the contract drawings or in the specifications is the only approved data to be used for construction surveying. This data will only be available on Airport Control Points. It is recommended that contractor contact Airport Survey Office to verify that horizontal and vertical data on contract drawings is correct, before beginning any work.
  6. The coordinate (X, Y) data published on Airport Control Points is based on the DIA LDP coordinates.
  7. The Airport Survey Office will provide the contractor with information on implementing the DIA LDP coordinate system. It is up to the Contractor to use the correct methodology in performing any survey task.

### 3.02 TEMPORARY CONTROL

- A. When a contractor establishes temporary control stations for airport construction work they must follow FAA guidelines. All project temporary control stations must be tied to the National Spatial Reference System (NSRS) through the use of the a) National Geodetic Survey (NGS) Online User Positioning System (OPUS) or b) to DIA Survey Control Points provided by the Airport Survey Office. Temporary Control may be necessary based on project site location. Below are the acceptable means to establish temporary geodetic control for airport construction:
1. Temporary Control must be established under close cooperation with the Airport Survey Office following the procedures outlined in A C150/5300-16 *General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to National Geodetic Survey* only in the following cases:
    - a) **Large Airport Airfield Construction Project** that significantly changes the airport geometry and would trigger the need to acquire new Digital Stereo Imagery following AC 15 0/5300-17 *General Guidance and Specification for Aeronautical Survey Airport Imagery Acquisition and Submission to the National Geodetic Survey*. Examples include a new Runway and Taxiway Complex, significant modification of existing Runway or Taxiway system, development of new outboard device pad complex or establishment of new mid airfield concourse and terminal



complex. The size and complexity of the project will dictate the need to acquire new Digital Stereo Imagery for significant construction.

- b) **Construction that establishes a new ILS CAT II/III Operations**
- c) **New Instrument Development Procedure**
- d) **New Airport Layout Plan Survey Update**
- e) **New Airport Obstruction Chart Update**
- f) **New Airport Mapping Database**

2. On Airport construction projects, the contractor, **excluding** large airport airfield construction projects referenced in 302.A.1, may use temporary control stations on their project site. These temporary stations must be tied to the nearest airport survey control points provided by the Airport Survey Office. All surveyors must obtain permission to establish temporary control points from the Airport Survey Office prior to beginning field work. The temporary points will have DIA LDP coordinate values only, along with NAVD88 elevations.

#### PART 4 - FAA REPORTING REQUIREMENTS

**EDIT THIS SECTION BELOW AS NEEDED BASED ON THE REQUIREMENTS OF THE PROJECT. NOT ALL CONSTRUCTION PROJECTS REQUIRE ALL OF THESE FAA REPORTING REQUIREMENTS. THE AIRPORT PROJECT MANAGER WILL MAKE THE DETERMINATION ON WHAT IF ANY FAA REPORTING REQUIREMENTS ARE NECESSARY BASED ON A CASE-BY-CASE DETERMINATION.**

##### 4.01 DESCRIPTION

- A. Work specified in this Section includes FAA required reporting requirements for projects created during actual airport construction which must be provided by the Contractor.
- B. Thorough reporting to the FAA is required for all Airport Construction Projects at DIA. Prior to beginning any fieldwork, a Contractor must submit the following items to the DIA Project Manager:
  - A Geodetic Control Plan (GCP) - only "required" when establishing **NEW** additional PACS/SACS on Airport Property
  - Statement of Work (SOW)
  - Survey and Quality Control Plan (SQCP)
  - Imagery Plan – only "required" if new aerial imagery is to be collected
- C. During the construction project as-built survey collection period, Weekly Status Reports are required to be submitted to the DIA Project Manager for DIA submittal to the FAA. Upon project completion, the Contractor must provide to the DIA Project Manager a final project survey report.

- D. All reporting requirements are mandatory requirements set forth by the FAA and not the airport. The airport is responsible for meeting FAA reporting requirements under Airport Improvement Program Grant Obligation #34.
- E. At a minimum, the Contractor:
- “...must provide all labor, equipment, supplies, materials, and transportation to produce and deliver data and related products as required...”
  - “...must submit in writing requests for modifications to or deviations from...specifications to the Airport, as soon as a need for them is identified.”
  - “...must notify the Airport of any unusual circumstances occurring during the performance of the tasks identified...that affect the deliverables or their quality...”
  - “...must submit a weekly project status report, a Quality Control Plan..., a Project Survey Plan..., and a Final Project Report...to the Airport.”
  - Must retain “...observation logs and other original records generated during (the completion of a) project...and must be retained for data accountability by the Airport.”

#### 4.02 GEODETIC CONTROL PLAN

- A. Denver International Airport (DEN) is a NPIAS or National Plan of Integrated Airport Systems Part 139 airport and has existing Primary Airport Control Stations (PACS) and Secondary Airport Control Stations (SACS). The survey monuments established in the airport vicinity must meet all accuracy requirements and other criteria specified in AC 150/5300-16, *General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey*. These monuments and their accurate connection to the NSRS assure accurate relativity between all surveyed points on an airport and the NAS, including navigation satellites.
- B. A Geodetic Control Plan is required only if establishing new additional PACS/SACS at DIA. Contact DIA Airport Survey Office to coordinate this plan if required. Refer to Form XXXX Geodetic Control Plan Template for guidance on establishing a Geodetic Control Plan.

#### 4.03 STATEMENT OF WORK

- A. The Contractor must use AC 150/5300-18 Table 2-1, “Survey Requirements Matrix,” to develop a complete Statement of Work (SOW) that can then be uploaded into the FAA Airports GIS website. The SOW is the Contractor’s written description of their methodology for surveying/consulting services that are going to be provided as part of the project (including specific features that will be surveyed, action items, timelines, necessary airport resources and general information). The SOW must be reviewed and accepted by the FAA. Refer to Form XXXX for a project Statement of Work (SOW) Template.

#### 4.04 SURVEY QUALITY CONTROL PLAN

- A. The Contractor must develop and submit a survey quality control plan (SQCP) to the DIA Project Manager. The FAA Airport Surveying–GIS Program manager or designated representative will review and approve the survey work and quality control plans. In these plans, detail the methodologies for data collection, data safeguarding and quality assurance. Provide insight into how you will completely check all data to ensure it is complete, reliable, and accurate. Identify data safeguards used to protect this sensitive and safety critical data. Utilize a checklist based quality control process with definable and repeatable standards for

each element ensuring consistency of work between different personnel within an organization. Refer to Form XXXX for a Survey Quality Control Plan Template.

- B. The Survey and Quality Control Plan must include the quality control (including error analysis) procedures and practices followed during data collection and provide traceability and adherence to the requirements of this guidance. At a minimum, the plan will include the following:
1. Summarize what methods you will use to ensure high-quality data.
  2. Describe the quality control measures used to ensure all data is checked, complete, reliable, and meets the accuracy requirements of AC 150/5300-18.
  3. Provide evidence of the methods used to collect the various types of features to meet the desired accuracies.
  4. Describe the data backup and archive procedures and methods used to ensure the integrity of the original data.
  5. Explain the methods used to check all file formats and provide a summary of the file-naming convention for all electronic files.

#### 4.05 IMAGERY PLAN

- A. An Imagery Plan is required only if collecting aerial imagery for a project.

#### 4.06 WEEKLY PROJECT STATUS REPORTS

- A. The Contractor shall submit a project status report to the Project Manager weekly, from the date of the task order until the work is completed. Include in the reports the percentage complete for each of the major portions of the work with the estimated completion date or completion date. Provide the status of ongoing work (with expected completion dates) and any unusual circumstances and/or deviations from this guidance. Refer to Form XXXX for a Weekly Project Status Report Template.

#### 4.07 FINAL PROJECT SURVEY REPORT

- A. The Contractor shall submit a Final Project Survey Report. The Final Survey Report is a compilation of documentation supporting the survey project providing a standardized delivery of field notes, raw survey data and project summary to facilitate the independent verification, validation, and quality assurance of the safety critical data. Refer to Form XXXX for a Final Project Survey Report Template.

### PART 5 - EXECUTION

**EDIT THIS SECTION BELOW AS NEEDED BASED ON THE REQUIREMENTS OF THE PROJECT**

#### 5.01 CONSTRUCTION LINES AND GRADES

- A. The Contractor shall make surveys and layouts as necessary to delineate the work. The Contractor shall make the surveys for the proper performance of the Work. As a part of such surveys, the Contractor shall furnish, establish and maintain in good order survey control points that may be required for the completion of the Work subject to the approval of the Project Manager as to their location, sufficiency and adequacy. However, such approval by the Project Manager shall not relieve the Contractor of his responsibility for the accuracy of his survey work.

- B. The Project Manager shall have the right to check surveys and layouts made by the Contractor prior to approving any of the Work. The Contractor shall give advance notice of not less than 48 hours to the Project Manager to enable such checking prior to placing any Work. The Contractor shall furnish assistance as may be required for checking purposes when so requested by the Project Manager.
- C. The Contractor shall furnish skilled labor, instrument platforms, ladders and such other temporary structures as may be necessary for making and maintaining points and lines in connection with the surveys required.
- D. The City may draw the Contractor's attention to errors or omissions in lines or grades, but the failure to point out such errors or omissions shall not give the Contractor any right or claim nor shall in any way relieve the Contractor of his obligations according to the terms of this contract.
- E. The Contractor's instruments and other survey equipment shall be accurate, suitable for the surveys required in accordance with recognized professional standards and in proper condition and adjustment at all times. Surveys shall be performed under the direct supervision of a Colorado licensed surveyor.
- F. Field Notes:
  - 1. The Contractor shall record surveys in field notebooks or as electronic field notes, whichever is more appropriate to the type of survey work. Copies of the original pages of field notebooks shall be furnished to Project Manager and the Airport Survey Manager at intervals required by the Project Manager. Each field notebook shall be furnished to the Project Manager when filled or completed. No erasures are allowed on the data entered in the field book. Cross out errors, and write correct entries above. The person that makes correction in the field book should initial above corrections made. An explanatory note shall be made for all corrections to original figures. All editing of computer records shall be done on a copy of the original with all changes initialed. Electronic data submission from data collectors shall be provided in formats in accordance with Design Standards Manual Volume 12 as listed in Sub Part 1.01E of this document. Electronic data files can be used to supplement field books and shall be supplied to the Project Manager and Airport Survey Manager on Compact Disk (CD).
  - 2. If the Project Manager or Airport Survey Manager finds errors in the field notes he will return them to the Contractor for correction and resubmission. This review does not relieve the Contractor from the responsibility of maintaining accurate survey data. Whichever method of note-taking the Contractor starts with, he must use the same method throughout the contract duration. If the Project Manager finds errors in the field notes he will return them to the Contractor for correction and resubmission. This review does not relieve the Contractor from the responsibility of maintaining accurate survey data.
- G. The Project Manager may at any time use line and grade points and markers established by the Contractor. The Contractor's surveys are a part of the Work and may be checked by the Project Manager or his representatives at any time. The Contractor shall be responsible for any lines, grades or measurements that do not comply with specified or proper tolerances or which are otherwise defective and for any resultant defects in the Work. The Contractor will be required to conduct re surveys or check surveys to correct errors indicated by review of the field notebooks.

**THE NEXT SECTION OUTLINES THE MAJOR TYPES OF CONSTRUCTION SURVEYS CONDUCTED AT AN AIRPORT. DELETE ANY SURVEY TYPE THAT DOES NOT APPLY TO THE SCOPE OF PROJECT WORK.**

## 5.02 AS-BUILT CONSTRUCTION SURVEYS

- A. Denver International Airport contractually requires record drawings of all construction projects that occur on airport property. Layout or stake-out surveys are the translation of construction plans into physical points on the ground used as a basis for the actual construction. The airport requires the collection of layout (stake-out surveys) for the placement of sub surface utilities to capture the location of sub-surface utilities before they are covered. All As-Built (Airport Record Drawing) construction surveys require electronic data submission that is compliant with Design Standards Manual Volume 12 12 as listed in Sub Part 1.01E of this document. FAA requirements for construction as-builts are contained in AC150/5300-18B Chapter 5. However, in the interest of simplification on many varying FAA standards contained in AC150/5300-18B, Denver International Airport desires standard accuracy requirements at engineering quality for all features collected in as-built airport record drawings. These requirements are for 0.25 ft horizontal accuracy and 0.25 ft vertical accuracy. Denver International Airport positional accuracy requirements often exceed FAA mandated accuracy requirements for features contained in AC150/5300-18B Chapter 5. If the contractor is unable to meet Denver International Airport engineering survey accuracy of 0.25ft, the contractor must meet minimum FAA mandated accuracy requirements contained in AC150/5300-18B Chapter 5. The contractor must notify the Project Manager of any deviations in accuracy standards that depart from 0.25 ft vertical/horizontal. Please reference the feature(s) involved, and explain why you must deviate from the accuracy requirement and what accuracy the feature(s) were collected in both vertical and horizontal planes.

General As-Built Surveys should at minimum address the following:

1. Collect all manmade objects on airport property.
2. The identification of the boundary lines of the project tract using the features in the.
3. Show lines of original lot boundaries.
4. The collection of all existing roads, alleys and easements with their widths and platted.
5. The collection of sufficient spot elevations defining the surface drainage on the project site and within 50 feet outside the boundary.
6. Identification of Airport control points used in the survey.
7. Locate and classify all visible evidence of utilities and storm water drainage features on or within 50 feet of the project boundary to include water lines, valves, backflow devices, meters and fire hydrants.
8. Sanitary sewer, manholes with invert and top elevation, pipe sizes through manholes with direction of flow indicated. Irrigation lines, catch basins, storm sewer pipes, junction boxes with inverts, type of inlet, pipe sizes, pipe types and direction of flow. This includes but is not limited to swales, curbs, gutters with spot elevations and direction of flow.
9. Sidewalk, street parking, loading areas, driveway width(s) along with the edge(s) of existing paved areas.

10. Power poles, guy wires, and overhead power lines.
  11. Trees, tree groupings and shrubs.
  12. Model existing building structures, fences or walls on site and within 50 feet of the property line.
  13. Show existing contours on 0.50 foot intervals if existing site elevations vary by greater than 1.5 feet.
  14. Existing natural features such as high points, water courses, depressions, ponds, marshes, and swamps.
  15. Location of any protected species habitat or environmentally sensitive lands or vegetation, as well as any known historical or archaeological uncovered during construction.
  16. Identify any objects under construction as "Building Under Construction". Determine the elevation of the object at time of survey. If a construction crane extends above a feature under construction, it is necessary to determine the elevation and position of the crane. Identify, classify and report
  17. Exceptions to survey collection requirements include: Annual weeds, corn, millet, alfalfa etc. Construction equipment and debris, including dirt piles and batch plants which are:
    - a. Temporary in nature
    - b. Under the control of the airport
    - c. Located on Airport Property
- B. As-built measurement for items that will be hidden or visible including all civil, mechanical, electrical, control work and all utilities that are placed in concrete, earth or behind walls shall be made by and under the direction of a Colorado licensed surveyor while the work is exposed and the measurements submitted to the Project Manager. Unless noted otherwise the measurements shall show the final location within 0.1ft of their actual horizontal and vertical location based upon DIA LDP coordinates and NAVD88 vertical datum. Items located within or five feet beyond a building shall be referenced to building column lines and finish floor elevations. Special attention shall be paid to items requiring service, sensors, and items with moving parts, access points and locations of junctions, elevation changes and directional changes. If a construction project alters any natural (including topography) or man-made feature that was not specifically addressed in the project scope of work, the Contractor is responsible for collecting the change in the feature(s) affected by the project and supplying those affected features in the final as-built survey.
- C. Survey notes shall be supplied to the Project Manager prior to covering up the work. Survey notes shall also be supplied to the DIA Survey Manager in an electronic format that can be read in AutoCAD 2010 or earlier version.
- D. Should the submitted as-built drawing or model fail a quality control check, the Contractor is responsible for correcting the as-built survey to comply with airport standards.
- E. The Airport Survey Office has the right to enter any construction site, at any time, and request from the contractor any:
1. Survey Field Notes

2. All FAA Weekly Project Status Reports
  3. Geo-tagged Photographs (if required by FAA depending on project location)
  4. Airport Survey Control Points used
  5. Survey measurement files used in data collection
  6. Inspect Survey Equipment Used by Contractor
- F. The Airport Survey Office may also check site survey work with their own survey instruments to ensure survey work is within tolerance requirements. Any problems found by the Airport Survey Office during site inspections are to be reported to the Project Manager.

### 5.03 SUBSURFACE UTILITIES ENGINEERING (SUE)

- A. Refer to Technical Specifications Sections 01020 for information related to underground utilities.

### 5.04 NAVAID SURVEY

- A. If an Airport construction project installs new aeronautical navigational equipment or changes any aspect of existing Airport Navigational Aids, compliance with FAA criteria is necessary. The Navaid may be owned or operated by either by the FAA, or the City & County of Denver, Colorado. Prior coordination with the Planning Department and Airport Survey Office is required to obtain specific technical survey requirements.

A list of common Airport Navigational Aids is provided below:

1. Air Route Surveillance Radar (ARSR)
2. Airport Surface Detection Equipment (ASDE)
3. Airport Surveillance Radar (ASR)
4. Distance Measuring Equipment (DME)
5. Fan Marker (FM)
6. Localizer (LOC)
7. Glide Slope (GS)
8. End Fire Types (GS)
9. Inner Marker (IM)
10. Middle Marker (MM)
11. Outer Marker (OM)
12. Back Course Marker (BCM)
13. Localizer Type Directional Aid (LDA)
14. MLS Azimuth Antenna (MLSAZ)
15. MLS Elevation Antenna (MLSEL)
16. Non-Directional Beacon (NDB)
17. Simplified Directional Facility (SDF)

18. Tactical Air Navigation (TACAN)
19. VHF Omni Directional Range (VOR)
20. VOR/TACAN (VORTAC)
21. Airport Beacon (APBN)
22. Visual Glide Slope Indicators (VGS)
23. Runway end Identifier Lights (REIL)
24. Approach Light System (ALS)

#### 5.05 CONSTRUCTION ALTERING/REHABILITATING AIRPORT RUNWAYS (ALL RUNWAYS AT DIA)

- A. Significant application of special survey criteria for collecting as-built conditions after any construction or alteration of a runway is most critical to the FAA and hence requires construction is complete as well as utility collection when subsurface utilities are being placed in the ground. Any construction which will take place in areas defined below needs prior coordination with the DIA Planning Department to create a survey plan that meets specific FAA criteria. No surveying should take place prior to the Airport Project Manager coordinating with the DIA Planning Department and Airport Survey Office.

1. Construction on paved Runway Surface
2. Construction on Runway Shoulders
3. Construction in Runway Safety Area
4. Construction in Runway Protection Zone
5. Construction on Runway Blast Pad

#### 5.06 CONSTRUCTION TOPOGRAPHIC SURVEYS/DESIGN SURVEYS

- A. Topographic/Design surveys determine the shape and slope of the construction project area allowing the user to visualize the rise and fall of the land. Typically, airport topographic surveys provide landform data for planning studies, engineering designs, navigational aid installation or to support a new instrument flight procedure.

Contour Interval	Vertical Positional Accuracy (in feet)	Horizontal Positional Accuracy (in feet)
1 foot	±0.50	±1.0
2 feet	±1.30	±2.0
4 feet	±2.60	±4.0
5 feet	±3.20	±4.0
10 feet	±6.50	±8.0
Spot ground elevations	±0.20	±2.0
Spot paving elevations	±0.05	±1.0
Well defined planimetric features	±0.10	±1.0

1. Document the location of permanent structures including bridges, culverts and tunnels.
2. Document the location of street or road paving entrance drives, openings, and sidewalks.
3. Classify the elevations on the top of curbs, gutters and sidewalks.



4. Provide spot elevations covering the entire survey limits showing high points, low points, and grade changes. This should be done at sufficient intervals to represent the general character of the terrain.
  5. Location and elevation of lakes, rivers, streams or drainage courses on or near the airport or design area.
  6. Location, diameter, and species of all trees over a 6-inch diameter.
  7. Outline the perimeter outline of thickly wooded areas.
  8. Electric utilities – the location of power poles, guy wires, anchors, vaults, etc.
- B. As with other aspects of airport surveys, the positional accuracy of the topographic survey ensures the data collected meets the needs of the FAA. The following relative positional accuracies are provided above as a general guide for topographic surveys and are specified at the 95% confidence level. Collect and provide the location and elevation of water and gas components extending more than 3 inches above the surface. These components include items such as water or gas valves, standpipes, meters, regulators, fire hydrants, etc. Locate, classify, and determine the elevation (MSL) of other utility components such as telephone or light poles, manholes, boxes, etc., visible on the airport.

#### 5.07 PROPERTY BOUNDARY SURVEYING/LAND-USE

- A. All property surveys on airport property need to comply with the requirements for the State of Colorado and be conducted by a licensed surveyor in the state. For more details please see the following links.

**Colorado State Constitution**

Article XX – Home Rule

<http://www.michie.com/colorado/>

**Colorado Revised Statutes Regarding Land Surveying**

<http://www.dora.state.co.us/aes/Statute-PLS.pdf>

**State Board Rules and Regulations**

[http://www.dora.state.co.us/aes/AES2008\\_Rules\\_Bylaws\\_II.pdf](http://www.dora.state.co.us/aes/AES2008_Rules_Bylaws_II.pdf)

**State Board Policies**

<http://www.dora.state.co.us/aes/Policies-PEPLS.pdf>

**City and County of Denver Municipal Code**

Chapter 49 – Article III Layout of Streets

Chapter 50 Subdivision of Land

<http://www.municode.com/Resources/gateway.asp?pid=10257&sid=6>

- B. When necessary, the surveyor will set boundary monuments in accordance with the accepted surveying practice and legal requirements so that, upon completion of the survey, each corner of the property and each referenced control stations will be physically monumented. When it is impossible or impracticable to set a boundary monument on a corner, the surveyor will set a reference monument, similar in character to the boundary monument and preferably along one of the property lines intersecting at the corner. When a reference monument is used, clearly identify it as a reference

monument on the plat of the property and in any new deed description, written for the property. Every boundary monument and/or reference monument set by the surveyor will, when practicable:

1. Be composed of a durable material.
  2. Have a minimum length of thirty inches with a 2 inch minimum diameter durable metallic cap
  3. Have a minimum cross-section area of material of 0.2 square inches.
  4. Be identified with a durable marker bearing the surveyor's registration
  5. Number of (PLS) with company name and date, should be stamped on the cap
  6. Be detectable with conventional instruments for finding ferrous or magnetic objects.
- C. When a case arises due to physical obstructions where a boundary or reference monument cannot be conveniently or practically set, then alternative monumentation will be established for the particular situation. This alternative monumentation must be durable and identifiable (e.g. chiseled "X" in concrete, drillhole, etc.).
1. Reference Contract General Conditions, GC 31 and GC 318.

## 5.08 SPECIAL SURVEYS

- A. Under the contract City may require a special type of data collection – High Definition Scanning (HDS) or picture images with geo-tagging. Contractor shall follow the Standards for HDS scanning. Denver International Airport currently utilizes the Leica HDS C10 Scanner to collect data and Leica Cyclone 7 to process point clouds and export deliverables for CAD/BIM/GIS.
- B. All contractors must use proper and compatible HDS instruments and post processing software to assure that the final deliverables will fit in the following requirements:
1. Acceptable file formats:
    - DWG and DXF
    - GIS SHP files
    - RVT-BIM Rivet File
    - TXT, CSV, XYZ format for points with coordinates and elevation
  2. Content in acceptable file formats
    - Solids
    - Shapes
    - Break lines
    - Point, Polyline, Line, Polygon, Multipatch
    - TIN,
    - Image –geotaged JPG, TIFF

## **5.09 SURVEYS FOR MEASUREMENT FOR PAYMENT**

- A. When the specifications or the Project Manager require items in the Schedule of Prices and Quantities to be measured by surveying methods, the Contractor shall perform the surveys. All such surveys, including control surveys run for establishing the measurement reference lines, shall be performed in the presence of the Project Manager or his representative who will witness the surveying operation and who will sign the field notes or keep duplicate field notes, at the Project Manager's option. The Contractor will reduce the field notes and calculate final quantities for payment purposes. The note reductions and calculations will be given to the Project Manager upon request.

## **5.10 SURVEYING ACCURACY AND TOLERANCES IN SETTING SURVEY, LAYOUT AND QUANTITY CALCULATION STAKES**

- A. Control traverse field surveys and computations shall be performed to an accuracy and precision of at least 1:40,000.
- B. The tolerances generally applicable in setting survey stakes shall be as set forth below. Such tolerances shall not supersede stricter tolerances required by the Drawings or Specifications, and shall not otherwise relieve the Contractor of responsibility for measurements in compliance therewith. Tolerances in setting survey stakes shall be as follows:
1. Tolerance on Error in Line, Kind of Survey Stake or Mark Distance Tangent, Markers on hubs and monuments, curves, on centerline and offset centerlines: 1:20,000, 0.01 ft, 10 sec.
  2. Intermediate stakes or marks on centerline and offset centerlines: 1:5,000, 0.05 ft, 1 min.
  3. Grade Stakes or Marks for: Excavation and backfill; slope stakes +/-0.10 ft
  4. Steel reinforcement and formed concrete ACI and AISC specified tolerance. If none described then the tolerance is +/- 0.02 ft.

## **PART 6 - MEASUREMENT**

### **6.01 METHOD OF MEASUREMENT**

- A. Construction as-built surveying shall be measured per lump sum for all work described herein, including preparation of survey plan documents, field surveying, data reduction and attribution, data deliverables, and final survey report.


## **PART 7 - PAYMENT**

### **7.01 METHOD OF PAYMENT**

- A. Payment shall be made at the contract unit price per lump sum.

Payment shall be made under:

As-Built Surveying and FAA AGIS-compliant Data Deliverables.....per lump sum

 <p><b>DENVER INTERNATIONAL AIRPORT</b></p> <p><b>Contractor's</b></p> <p><b>FINAL PROJECT SURVEY REPORT FORM</b></p>	Contract Name:		
	Contractor:		
	From MXX	To MXX	Year xxxx
	Contract No.:	Date:	
	AIP No.	Prepared by:	
	Report No.:		
Weather: <input type="checkbox"/> Sunny <input type="checkbox"/> Fair <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain _____ inches <input type="checkbox"/> Snow _____ inches Max. Wind: _____ mph Max/Min Temp. _____ deg F/ _____ deg F			

### FINAL PROJECT SURVEY REPORT FORM (IF REQUIRED)

#### GENERAL

The Final Project Report is a compilation of documentation supporting the survey project providing a standardized delivery of field notes, raw survey data and project summary to facilitate the independent verification, validation, and quality assurance of the safety critical data. In the final project report, address each of the following areas. Items highlighted in blue are to be filled out by Contractor when stipulated by your DIA Project Manager based on a case-by-case determination depending on project location, project scope, project impact to the electronic Airport Layout Plan. This is not mandatory unless stated so by the DIA Project Manager overseeing the project bid proposal prior to project award.

All text highlighted in blue are examples and should be replaced by the Contractor.

#### Website Resources:

Airports GIS: <https://airports-gis.faa.gov/>  
 AVN Data System: [http://avnnet.jccbi.gov/datasheet\\_prd/](http://avnnet.jccbi.gov/datasheet_prd/)  
 AVN Data (Public): <http://avnwww.jccbi.gov/datasheet/>  
 AVN (Charts +): <http://www.avn.faa.gov/>  
 NGS Data & Imagery: <http://www.ngs.noaa.gov/>  
 UDDF Data: <http://www.ngs.noaa.gov/AERO/UDDFdat.htm>  
 PACS/SACS Data: <http://www.ngs.noaa.gov/AERO/aero.html>

#### SAMPLE TEMPLATE

##### Project Identification Data

1. Official name of airport and FAA assigned location identifier. (Denver International Airport, KDEN)
2. Airport Address (Street, City, State, Zip) (8500 Pena Blvd, Denver, Co 80249)
3. Client Name (City and County of Denver, Colorado)
4. Project, Contract, or Grant Number assigned (if AIP/PFC money was used)
5. Northwest Mountain Region
6. Start and end dates of project (From contract signing to delivery of data)

7. Contractor point of contact (including name, company name, address, telephone number, email)

### Project Summary

Provide a written overview of the project details and conclusions. In the summary, describe the scope of the survey identifying the key elements for collection (i.e. runway, obstruction, mapping and NAVAID collection). Provide background information on the source(s) of existing airport geospatial data (FAA, airport engineering, etc.) used in the project. Describe any conditions affecting the survey such as, any equipment failures, weather, scope of project, site accessibility, reconnaissance, and/or any other problems experienced.

### Survey Data Conclusions

Provide your conclusions regarding the following subjects as they relate to this project.

**Control Network Survey Results/Conclusions:** Provide a description of the DIA LDP control network utilized as the basis of the survey completed. Include information on the source of the control referenced, whether it was established or verified, and comments on the recovery and status of the control monumentation. When utilizing an existing control network, provide verification computations and results between control points. Also provide information on the data collection methods used, and the third party software vendor used in data reduction.

**Survey Data Collection Conclusions:** Provide written and, as necessary, pictorial descriptions of significant findings from the survey results to ensure the information being provided is clear to the reader. Include information on the data collection methods used, and identify the hardware/software used during the survey. Examples of typical information to report are (but not limited to):

1. Output information and published data comparison for runway end, stopway and displaced threshold positions.
2. Significant objects of concern such as temporary or mobile objects.
3. Comments on current or future planned construction at the airport that causes concern.
4. Note conditions that affected the final solutions of the survey (vegetation, access, air traffic, etc.).
5. Significant NAVAID situations (proposed locations, instruments/lighting removed, etc.).
6. Boundary encroachments or significant misclosures on the airport property boundary.
7. Utility system situations (significant utility systems found otherwise unknown, potentially hazardous situations, etc.).

**Data Processing/Adjustment Conclusions:** Provide information on the software used to reduce the data. Comment on issues or concerns discovered during the use or translation process of existing data. Also provide comments on any issues or outliers found during the reduction process considered important for the retracement of the survey by the validation team.

**Recommendations/Additional Comments:** Provide comments on the survey project including suggestions to improve future work specifications or any information providing additional explanation and understanding of survey project and results

## Field Note Information

**Geodetic Control Data:** Provide the raw-data files collected containing the data used for establishment or verification of the geodetic control, including any data used to plot temporary points occupied. Typically, these files include the original raw GPS data files (in both the manufacturer's download format and in RINEX II format), binary files containing ionosphere modeling information and vector reduction and adjustment files.

**Survey Information and Data:** Providing the survey data allows the independent verification and validation team to analyze the data. Provide the instrument or data collector raw measurement data files used to compute final positional data. Provide the independent verification and validation team the same information you provide for office computation/compilation. The internal and external quality assurance teams use this information to verify and validate the survey. Provide digital photographs taken during the survey to document or provide clarification of the survey data submitted. This includes photos of stations occupied, obstructions to visibility or any other information you wish to convey to DIA and the independent verification and validation team regarding the survey. Scan and include all pages of the field book, log sheets or sketches completed during the survey.

**Deliverables Checklist:** The tasks completed during the survey process require careful planning and execution to ensure the geospatial data generated complies with the specifications of Technical Specifications Division 1: Section 01 32 23-LAYOUT OF WORK AND SURVEYS. Provided below is a checklist identifying specific details to assist in ensuring proper planning and execution of a successful survey project report. The FAA provides an appropriate checklist for the deliverables on the program website at <https://airports-gis.faa.gov>.

1. Survey and Quality Control Plan (completed before data collection begins)
2. Weekly Project Status reports provided to DIA Project Manager (PM)
3. Final Project Report (developed for all survey types used during construction)
4. Digital Files to be delivered
  - a. Provide the documentation required for each feature as defined by Design Manual Volume 12 and Project Plan Technical Specifications Division 1, Airport Data Features. Documentation types include data such as digital photographs, scans of field notes (log sheets, field sketches, field book pages, etc.), and field/office and quality assurance checklists used.
  - b. Provide the raw observational data collected from terrestrial and/or photogrammetric survey operations. Providing this data for all surveys allows the independent verification and validation team to retrace the survey. The types of data files to be delivered (but not limited to) are:
    - i. Data collector files
    - ii. GPS receiver files
    - iii. CORS data downloaded
    - iv. Photogrammetric observation files
    - v. Other field measurement device's digital raw data (range finder, scanner, etc.)
5. Provide the final processing, adjustment or reduction files used to produce the final data. This

includes the results of independent software files produced during the reduction of the final data.  
The intent is to provide the data necessary to recreate the data delivered if required.

6. Provide an airport point of contact list for use by the independent verification and validation team.
7. Copies of the transmittal letters for all deliveries posted to the Project Manager at DIA.

## GEODETIC CONTROL PLAN TEMPLATE

Items highlighted in blue are to be filled out by Contractor when stipulated by your DIA Project Manager based on a case-by-case determination depending on project location, project scope, and project impact to the electronic Airport Layout Plan. This is not mandatory unless stated so by the DIA Project Manager overseeing the project bid proposal prior to project award.

Airport Name:	Denver International Airport
Airport LocID:	DEN
Airport City and State:	Denver, Colorado
Part 139 Status:	Certified
Airport Reference Point (ARP):	39-51-41.9630N 104-40-23.4390W
Airport Elevation (ft):	5431
PACS Designation and PID	DVX P (AE5243)
SACS Designation and PID	DVX N (AE5242)
SACS Designation and PID	DVX Q (AE5244)

Denver International Airport (commonly abbreviated DIA) covers 53 square miles. As a regional hub with six runways, it is the fifth busiest airport in the United States. DIA recognized several years ago that a network of closely spaced, stable and accurately positioned Airport control monuments would improve the accuracy of surveys and mapping necessary for airport operations. Close proximity of Airport control monuments to project areas also reduces the impact of surveying activity on airside operations and limits the potential for incursions by contractors not well-versed in airfield safety. For these reasons, DIA has invested heavily, and continues to invest, in constructing and positioning Airport control monuments around the airfield. Airport Control points were surveyed using standards and specifications published by the National Geodetic Survey (NGS). The survey data was submitted to NGS for review and, was found to meet their specifications, the monuments positions are published as part of the National Spatial Reference System (NSRS). The Primary Airport Control Stations (PACS) and Secondary Airport Control Stations (SACS) are included in this network of monuments.

All geospatial data submitted to the FAA will be based on North American Datum of 1983, NSRS 2007 NAD83(2007) adjustment and North American Vertical Datum of 1988 (NAVD88-Geoid 09). Grid positions will be reported to FAA in Colorado State Plane Central Zone coordinates in units of US Survey Feet. DIA has established a low distortion coordinate projection (DIA\_LDP) based on NAD83 (2007) for use in engineering design and construction projects. This projection eliminates the need for applying a scale factor to field measurements and will be used in preparing engineering plans and constructing the project. DIA LDP positions will be precisely transformed to the required State Plane Coordinate zone by DIA staff



with commonly used surveying and engineering software prior to the submittal to FAA.

The Geodetic Verification Survey described below is a modification of the procedures in AC-18B, Section 2.6.10.1, Airport Geodetic Control. Section 2.6.10.1 allows the use of any two Airport Control Points with published NSRS coordinates as the basis for a local coordinate grid for engineering purposes. The modification requires that temporary control marks set during an engineering/construction survey for DIA be directly tied to two different DIA Control monuments with position and elevations published in the NSRS-NGS web Site. These stations will have 6-character permanent identifiers (PIDs). Section 2.6.10.1.1, Verification of Survey Marks is also modified to delete the requirement for verification of PACS and SACS and replace it with a requirement to verify the unmoved position and elevation of nearby Airport Control monuments, to be used in possible establishment of temporary monuments for construction control.

### **7.03 GEODETIC VERIFICATION SURVEY INSTRUCTIONS**

The geodetic verification survey is made to assure the un-moved position of the Airport control monuments that are used to tie the temporary design/construction control points to the National Spatial Reference System. Acceptable monuments will be identified by the DIA Survey Office and will be limited to monuments of the NSRS with permanent identifiers (PIDs) and published positions and elevations. Temporary design/construction control points established for this project will be tied by direct measurement to at least two separate Airport Control Monuments.

The contractor will attempt to recover each identified monument and determine its condition, stability and suitability for the intended use. A location sketch and visibility diagram will be prepared for each station. A minimum of three digital photographs, one of each type described in AC-18B, Section 1.5.2.1, will be captured, captioned and properly named. A recovery note will be filed with NGS if no current recovery is shown in the NSRS database.

After recovering the identified NSRS Airport control monuments, the contractor will conduct two independent Global Positioning System (GPS) sessions, each 10 minutes or longer with a 5-second collection interval, between these existing stations. Alternatively, the contractor may measure directly between the stations with a total station with a calibrated electronic distance measuring instrument. The collected data will be processed and adjusted, as necessary, and the resulting surveyed distances and elevation differences between monuments compared to computed inverses between published positions. The computed distance between adjacent monuments must agree with  $\pm 3$  cm. The difference in ellipsoidal height (if GPS is used) must agree to  $\pm 4$  cm, and the difference in orthometric height must agree to  $\pm 5$  cm. The contractor will contact the DIA Survey Office for guidance if a discrepancy is found that is greater than these tolerances. The DIA Survey Office may identify additional control monuments to be used by the contractor or if no suitable monuments are available, contact NGS for advice on how best to proceed.

## 7.04 SAMPLE TEMPLATE

Project Name: **Denver Intl**  
Project Location: **(runway/taxiway/apron/terminal, etc)**

Contractor Name : **The contractor**  
Contractor Survey Contact: Name **XXXXXXXXXXXXX**  
Phone: **XXXXXXXXXXXXX**  
Email: **XXXXXXXXXXXXX**  
Grid Coordinate System: **DIA\_LDP or Colorado Central Zone**  
NSRS Station 1 Designation/ PID **Name 1 (PID001)**  
NSRS Station 2 Designation/ PID **Name 2 (PID002)**  
NSRS Station 3 Designation/ PID **Name 3 (PID003)**  
Estimated Start Date **January 1, 2012**  
Estimated Completion Date **May 1, 2012**

Items highlighted in **blue** are to be filled out by Airport Staff/Contractor.

### Identify which method will be used to establish accurate connection to the National Spatial Reference System:

- ☐ Project will establish permanent Geodetic Control  
☐ Project will use existing permanent Geodetic Control  
☐ Project will establish and use temporary Geodetic Control

**Project Summary:** This section should describe the *WHAT* and *WHY* of the project. List the information from the statement of work describing what level of geodetic control should be used and how it will be processed. This section should also identify the following information.

- Airport contact and access information
- Whether airport is controlled or uncontrolled
- Whether or not an escort is required
- Airport radio frequencies
- Intervisibility conditions between the PACS and SACS
- Comments on any future construction, unusual circumstances, use of witness posts, and any other miscellaneous information.


**Station Table:** Fill out the Station Table and Reconnaissance Checklist, documenting the information regarding the stations in the project. For new stations, include the proposed name in the "Name" column, identify them as "proposed" in the "Station Type" column, and indicate the proposed type of mark (rod, concrete, disk in bedrock) in the "Comments" column. For existing stations, the name and PID must be used exactly as listed in the NGS database and must be this way in all survey records. For existing stations found but not proposed for use, state the reason(s) in the Comments and Recommendations" column. Identify the PACS, SACS, and all NSRS ties for the airport. Give status of marks not used and the reason.

**3. Station Reconnaissance:** Describe what methods the contractor will use to identify and reconnoiter existing control on and surrounding the airport. Summarize planned reconnaissance activities including the recovery of existing monuments and methods used to identify candidate stations for use in establishing a datum tie to the NSRS for the survey.

**4. Airport Control Plot:** Plot all "suitable" control on or near each airport on an airport map. Label each station with its designation and indicate if it is a PACS, SACS, Bench Mark, HARN Tie, or subsidiary control. Refer to appendix 5 of AC 150/5300-16 for an example airport control plot.

**5. Photographs:** Submit photographs in accordance with AC 150/5300-16 section 8.2.10 for all suitable stations recovered during the survey, and for all new monuments that will be set.

- 6. Station Location Sketch and Visibility Diagrams:** Submit a Location Sketch and Visibility Diagram form to provide information from the control reconnaissance on the station. Submit forms for all suitable stations recovered during the reconnaissance, and for all new monuments to be set
- 7. Station Descriptions:** Submit a Survey Station Description and Recovery form for each station. The descriptions provided in each form should be verified by the field team as they travel to each station for occupation. Discuss who, when and how the stations will be described appropriately using the WINDESC software for entry into the national database.
- 8. GPS Observing Scheme:** In this section discuss the length of sessions and number of occupations required to meet the requirements of AC 150/5300-16. This section should also identify the CORS, HARN, Benchmark and any A-order ties for the airport. Provide separate GPS observation schemes for the PACS and SACS. When establishing temporary control discuss the length of sessions and number of occupations used.
- 9. Project Vector Diagram:** Provide two diagrams, one depicting all stations occupied throughout the project area (except the SACS). a. Symbolically distinguish whether each station is a CORS, PACS, HARN Tie, Bench Mark or combination. b. Include 300km (or appropriate scale) dashed circles around CORS and CTCORS, and 50 km circles around PACS. c. Show the GPS vectors used for processing. Provide a second larger scale diagram depicting the relationship of the PACS and SACS including GPS vectors used for processing.
- 10. Proposed Instrumentation List:** Provide a complete listing of the survey equipment (GPS receivers, antennas, levels, etc.) to be used in the project. List the brand, model, and serial numbers for all survey equipment.
- 11. Data Processing Software:** Specify software name and version for the data processing software proposed for use. Ensure the current version of all software is used
- 12. Quality Assurance:** In this section describe HOW the contractor proposes to ensure the collection and delivery of quality data meeting the requirements. Describe the quality control measures that will be in place to ensure that all data will be checked, complete, and reliable and meet the accuracy requirements in these General Specifications (including error analysis). a. Describe how the contractor will complete and document checking of all manual computations (including check marks and initials) b. Describe how the contractor will complete and document checking all manual data computer entries c. Describe how the contractor will complete and document checking of file formats d. Describe how the contractor will complete and document checking all reports and data prior to submission. e. Describe how the contractor will backed up the collected and processed data and how they will ensure original data is not modified.
- 13. Data Format:** The final required section should describe how the field and office data are combined into a final data set for delivery. It should discuss what software will be used to develop the data set and how the data, features and feature attribution will be compiled.

 <p><b>DENVER INTERNATIONAL AIRPORT</b></p> <p><b>Contractor's</b></p> <p><b>Weekly Project Status Report</b></p>	Contract Name:		
	Contractor:		
	From MXX	To MXX	Year xxxx
	Contract No.:	Date:	
	AIP No.	Prepared by:	
			Report No.:
Weather: <input type="checkbox"/> Sunny <input type="checkbox"/> Fair <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain _____ inches <input type="checkbox"/> Snow _____ inches Max. Wind: _____ mph Max/Min Temp. _____ deg F / _____ deg F			

## WEEKLY PROJECT STATUS REPORT


### GENERAL

Example of a Weekly Project Status Report. This project status report concerns **survey** efforts only if required by the Project Manager as outlined during project award.

Items highlighted in **blue** are to be filled out by Contractor to complete the Weekly Project Status Report.

### SAMPLE TEMPLATE

Weekly Project Status Report													
Denver International Airport													
AIP X-XX-XXXX-XXX-20XX (only fill out if AIP funded, put N/A if not Federally Funded)													
Survey progress update #1													
July XX to July XX													
<p>Contractor ABC completed a second week of ground surveying. The first week verified PACS and this week we will be analyzing the collected obstruction survey data relative to the object identification surfaces. We will check both the required points for each obstruction zone and the navigational aids, and generate the appropriate field documentation. We completed subcontract negotiations with aerial photography sub Contractor CDE, Inc. and are submitting the proposed flight map with ground reference points for review and approval before completing our final week of field surveying. This week we will be setting aerial targets and surveying in the targets and PhotoID points, and collecting final outlying obstruction data. Aerial photography is promised to us 2 to 4 days after our targets are in place.</p> <p>Sincerely,</p> <p>Any Surveyor, P.S.</p> <p>SACS control, collected runway centerline, and primary surface topographic information.</p> <p>To date we have surveyed for Runway 12-30:</p> <table border="0"> <tr> <td>Airport Control (PACS, SACS, ANY B540)</td> <td>100%</td> </tr> <tr> <td>Runway and Stopway Ends</td> <td>100%</td> </tr> <tr> <td>NAVAIDS (VOR, NDB, Airport Beacon, VASI, PAPI, and REILs)</td> <td>100%</td> </tr> <tr> <td>Runway and Stopway Obstructions (Primary surface, approaches, transitional surfaces)</td> <td>100%</td> </tr> <tr> <td>Aircraft Movement and apron areas</td> <td>75%</td> </tr> <tr> <td>Prominent airport buildings / potential close-in obstructions</td> <td>42%</td> </tr> </table>		Airport Control (PACS, SACS, ANY B540)	100%	Runway and Stopway Ends	100%	NAVAIDS (VOR, NDB, Airport Beacon, VASI, PAPI, and REILs)	100%	Runway and Stopway Obstructions (Primary surface, approaches, transitional surfaces)	100%	Aircraft Movement and apron areas	75%	Prominent airport buildings / potential close-in obstructions	42%
Airport Control (PACS, SACS, ANY B540)	100%												
Runway and Stopway Ends	100%												
NAVAIDS (VOR, NDB, Airport Beacon, VASI, PAPI, and REILs)	100%												
Runway and Stopway Obstructions (Primary surface, approaches, transitional surfaces)	100%												
Aircraft Movement and apron areas	75%												
Prominent airport buildings / potential close-in obstructions	42%												

 <p><b>DENVER INTERNATIONAL AIRPORT</b></p> <p><b>Contractor's</b></p> <p><b>Statement of Work</b></p>	Contract Name:		
	Contractor:		
	From MXX	To M XX	Year xxxx
	Contract No.:	Date:	
	AIP No.		
	Prepared by:	Report No.:	
Weather: <input type="checkbox"/> Sunny <input type="checkbox"/> Fair <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain _____ inches <input type="checkbox"/> Snow _____ inches Max. Wind: _____ mph Max/Min Temp. _____ deg F/ _____ deg F			

## SURVEY STATEMENT OF WORK TEMPLATE

### GENERAL

Items highlighted in blue are to be filled out by Contractor when stipulated by your DIA Project Manager based on a case-by-case determination depending on project location, project scope, and project impact to the electronic Airport Layout Plan. This is not mandatory unless stated so by the DIA Project Manager overseeing the project bid proposal prior to project award.

All text highlighted in blue are examples and should be replaced by the Contractor.

#### Website Resources:

Airports GIS: <https://airports-gis.faa.gov/>  
 AVN Data System: [http://avnnet.iccabi.gov/datasheet\\_prd/](http://avnnet.iccabi.gov/datasheet_prd/)  
 AVN Data (Public): <http://avnwww.iccabi.gov/datasheet/>  
 AVN (Charts +): <http://www.avn.faa.gov/>  
 NGS Data & Imagery: <http://www.ngs.noaa.gov/>  
 UDDF Data: <http://www.ngs.noaa.gov/AERO/UDDFdat.htm>  
 PACS/SACS Data: <http://www.ngs.noaa.gov/AERO/aero.html>

### SAMPLE TEMPLATE

#### Administrative

Date: January 1, 2011

Airport Contact: Mr. Mark Gibbs  
 Senior Airport Planner  
 Airport Office Building  
 8500 Pena Boulevard  
 Denver, CO 80249-6340  
 Telephone 303.342.2692  
 FAX 303.342.2617  
 Mark.gibbs@flydenver.com

Prepared by: Airport Staff/Contractor  
 Contractors, Inc.  
 Somewhere, USA 76137-0610  
 Phone: 555-555-5555

Email Address: [JohnDoe@ContractorsInc.com](mailto:JohnDoe@ContractorsInc.com)

Project Title: [Commonly Referenced Project Name](#)  
Planned Start Date: [Expected Start Date](#)  
Estimated Completion: [Expected Completion Date \(or number of days\)](#)

## Objectives and Background

Provide overall project objective(s). Include location and describe impacts to any NAVAIDS, approaches, utilities and environmental features.

The project objective is to design and construct a 300 x 500' apron, with connecting taxiway, to provide parking for transient aircraft. The apron is east of RW 18-38 and north of Taxiway A and will be connected to Taxiway A via new Taxiway A-6. No building facilities are planned. The apron will not include light standards or other obstacles penetrating runway Object Identification Surfaces as defined in -18B, Section 2.7.1.1 or 2.7.1.3. A sketch illustrating the location of the planned work can be found at the end of this document.

## Requirements

Modifications to certain requirements pertaining to geodetic control are discussed in the Geodetic Control Form and only apply if the Contractor plans to install a **new** PACS or SACS at DIA. For most minor construction/routine maintenance projects, aerial imagery will not be collected and an imagery plan will not be submitted. If adequate geodetic control exists, no geodetic control plan will be required. Adequate geodetic control exists for Denver International Airport and hence unless a new runway is constructed, the Contractor does not need to file a geodetic control plan.

If required by the Project manager, the Contractor will submit weekly project status reports to the Airport. The reports will contain progress updates and any significant issues with the project including deviations from the planned schedule. If also required by the Project Manager, the Contractor will prepare a final report as required in AC-18B. DIA Planning staff will review and submit final survey report of behalf of PM and Contractor to FAA Airport GIS as required by FAA regulation.

The following Advisory Circulars will be used as guidance for this project:

- [AC 150/5300-16A "General Guidance and Specifications for Aeronautical Surveys: Establishment of Geodetic Control and Submission to the National Geodetic Survey."](#)
- [AC 150/5300-18B "General Guidance and Specifications for Aeronautical Surveys: Airport Survey Data Collection and Geographic Information System Standards."](#)
- [AC 150/5300-13, through Change 14 "Airport Design"](#)

If required, the Contractor must submit to the Project Manager and have approved by the FAA/NGS the following required implementation plan(s) prior to commencing fieldwork

- [Imagery Plan](#)
  - [Survey and Quality Assurance Plan](#)
  - [Geodetic Control Plan](#)
  - [Weekly Project Status Reports](#)
  - [Final Project Status Report](#)
- List all relevant requirements for the project. Geodetic Control Plan "Required" only if establishing PACS/SACS. Imagery Plan "Required" only on an as needed basis as determined by DIA Planning Department staff or the Airport Project Manager

## Geodetic Control

All geospatial data submitted to the FAA will be based on North American Datum of 1983, NSRS 2007 (NAD83 (2007) adjustment and North American Vertical Datum of 1988 (NAVD88). The AC-18B requirement to tie all data directly to the PACS and SACS is modified. DIA has invested heavily, and continues to invest, in constructing and positioning Airport control monuments around the airfield. These Airport control monuments were surveyed using standards and specifications published by the National Geodetic Survey (NGS). Their Horizontal and Vertical values are published on line with the PACS and SACS on the NGS Web Site. ([www.ngs.noaa.gov](http://www.ngs.noaa.gov)) The Airport Control Points provide accurate ties for contractors work, while minimizing disruptions to airfield operations and the potential for incursions by surveyors not familiar with safety procedures. The temporary construction control points established for this project will be tied to a minimum of two different Airport control monuments with published positions. The Contractor will verify that the monuments have not moved and will report any anomalies to the Airport Survey Department if detected.

The Airport Survey Office has identified the monuments to be used for this project and they are listed below:

The Airport Survey Office will provide the control points the Contractor will use for their project site. The Airport Survey Office must be the sole source for control used by Contractors on work conducted on Airport Property. Please contact the Airport Survey Office to Complete the SOW Monument Table

Station Name	PID	Type
DVX	AA0000	HV
DR	BB1111	HV
Name	CC2222	HV

Type Code H=Horizontal, V=Vertical, HV=Horizontal and Vertical

## Imagery

State No imagery will be collected or submitted for this project or if imagery will be collected for the project as dictated by the Project Manager please fill in the items listed below.

Per AC 5300-17B, imagery will show full leaf coverage.

Color Film to be used: [Kodak 2444](#) or [AGFA X-100](#), or better

The following Flight Missions will be performed:

Flying Height	Area	Photo scale	Ground Sample Distance
8,000' AGL A	1" = 1,600'		12 inch
2,300' AGL B	1" = 400'		4 inch

Area A – Entire project area to include all Object Identification Surfaces (OIS) as defined in AC 150/5300-18B, Sections 2.7.1.1.

Area B – All Airport Property including 6,000' off both ends of Runway 13/31 (VGPS) with 880-foot ext.

Orthorectified imagery will be submitted for **both** flight missions.  
Deliver data and information to NGS per 150/5300-17B, Paragraph 20.  
Data will be delivered to FAA per 150/5300-17B, Paragraph 22

### Survey and Quality Control

DIA has established a low distortion coordinate projection (DIA\_LDP) based on NAD83(2007) for use in engineering design and construction projects. This projection eliminates the need for applying a scale factor to field measurements. All field data collection will be accomplished using DIA\_LDP coordinates with deliverables otherwise formatted as specified in the appropriate advisory circular. All data must be submitted to DIA following the data submittal specification outlined in document Design Manual 12 Chapter 7: CADD-GIS Data Submittal Requirements. All data will be reviewed by DIA before it is submitted to FAA. DIA Survey Office staff will ensure the data collected or proposed for use in this project meets the tolerances specified in the above Advisory Circulars at the 95 percent confidence level (RMSE). DIA Planning staff will ensure that the data meets the required formatting and attribution standards and will re-project the data to the required State Plane Coordinate zone. DIA Planning Department will submit the data to the FAA Office of Airports, Airport Surveying-GIS Program. All data submissions to the FAA will be through the Airports-GIS website at <https://airports-gis.faa.gov/>. Contractors are not responsible for data submissions to the FAA.

The Contractor's surveyor will collect and provide as-built information and attributes for features which contain an X in the "Collected New" field. Additional features and attributes may be updated if they are encountered during the course of the survey. A Survey Quality Control Plan must be submitted to the project manager prior to commencing fieldwork if required by the Project Manager during project award.

The Airport Planning Office or Airport Project Manager can assist Contractors in familiarization with FAA required features that may be relevant to a particular project. Assistance is certainly available to Contractors who have questions regarding how to fill out the table below.

AC 150/5300-18B	Data Type	Description	Exclude	Collected New
<b>Airfield</b>				
AircraftGateStand	Point	Geographic position of painted stand positions on the stand guidance line usually marked by a yellow crossbar according to aircraft type.		



**TECHNICAL SPECIFICATIONS**  
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**SECTION 01 32 23 – LAYOUT OF WORK AND SURVEYS**

**DENVER INTERNATIONAL AIRPORT**  
**DIA Data Center**  
**CONTRACT NO. 201207370**

AircraftNonMovementArea	Line	Taxiways and apron (ramp) areas not under the control of air traffic.		
AirOperationsArea	Polygon	Air Operations Area is where security measures are enforced as specified in the airport security program. This area includes aircraft movement areas, aircraft parking areas, loading ramps, and safety areas and any adjacent areas.		
AirfieldLight	Point	Any lighting located within or near an airport boundary that provides guidance for airborne and ground maneuvering of aircraft.		
ArrestingGear	Line	Location of the arresting gear cable across the runway.		
FrequencyArea	Polygon	Area specifying the designated part of the surface movement area where a specific frequency is required by ATC or ground control. If there is only one frequency area for the airport, the polygon must cover the total air operations area.		
PassengerLoadingBridge	Polygon	A bridge for loading/unloading access to airplanes for passengers and crew.		
RunwayCenterline	Line	Continuous line along the painted centerline of a runway connecting the middle-points of the two outermost thresholds. Centerline is composed of many centerline points (see RunwayControlPoint). It is used to calculate grade and line-of-sight criteria.		
RunwayHelipadDesignSurface	Polygon	A three-dimensional surface that is used in runway or heliport/helipad design.		
RunwayIntersection	Polygon	The area in which two or more runways intersect.		
RunwayLAHSO	Line	Markings installed on a runway where an aircraft is to stop when the runway is normally used as a taxiway or used for Land and Hold Short Operations (LAHSO) as identified in a letter of agreement with the Air Traffic Control Tower (ATCT). A runway should be considered as normally used for taxiing if there is no parallel taxiway and no ATCT. Otherwise, seek input from ATCT.		
RunwayElement	Polygon	A section of the runway surface. The runway surface can be defined by a set of non-overlapping RunwaySegment polygons for pavement management purposes. RunwayElements may overlap Runway and RunwayIntersection features. Use RunwayElement to model the physical runway pavement in terms of surface, material, strength and condition in greater detail than just as a single piece of pavement.		
Stopway	Polygon	An area beyond the takeoff runway, no less wide than the runway and centered upon the extended centerline of the runway, able to support the airplane during an aborted takeoff without causing structural damage to the airplane. It is designated by the airport authorities for use in decelerating the airplane during an aborted takeoff.		
TaxiwayHoldingPosition	Line	A designated position at which taxiing aircraft and vehicles shall stop and hold position, unless otherwise authorized by the aerodrome control tower.		
<b>AC 150/5300-18B</b>	<b>Data Type</b>	<b>Description</b>	<b>Exclude</b>	<b>Collected New</b>
<b>Airfield</b>				
AirportSign	Point	Signs at an airport other than surface painted signs.		
Apron	Polygon	A defined area on an airport or heliport, paved or unpaved, intended to accommodate aircraft for purposes of loading or unloading passengers or cargo, refueling, parking, or maintenance.		

DeicingArea	Polygon	An aircraft deicing facility is a facility where: (1) frost, ice, or snow is removed (deicing) from the aircraft in order to provide clean surfaces and/or (2) clean surfaces of the aircraft receive protection (anti-icing) against the formation of frost or ice and accumulation of snow or slush for a limited period of time.		
TouchDownLiftOff	Polygon	A load-bearing, generally paved area, normally centered in the Final Approach and Takeoff Area (FATO), on which a helicopter lands or takes off. The Touchdown and Lift-off Area (TLOF) is frequently called a helipad or helideck.		
MarkingLine	3D line	Markings used on runway and taxiway surfaces to identify a specific runway, a runway threshold, a centerline, a hold line, etc. An element of marking whose geometry is a line.		
MarkingArea	Polygon	Markings used on runway and taxiway surfaces to identify a specific runway, a runway threshold, a centerline, a hold line, etc. An element of marking whose geometry is a polygon.		
MovementArea	Polygon	Runways, taxiways, and other areas of an airport used for taxiing or hover taxiing, air taxiing, takeoff, and landing of aircraft, exclusive of loading ramps and aircraft parking areas.		
Runway	Polygon	A rectangular area on a airport prepared for the landing and takeoff run of aircraft.		
RestrictedAccessBoundary	Line	A restricted area boundary identifies areas strictly reserved for use by authorized personnel only.		
RunwayArrestingArea	Polygon	Any FAA-approved high energy absorbing material of a specific strength that will reliably and predictably bring an aircraft to a stop without imposing loads that exceed the aircraft's design limits, cause major structural damage, or impose excessive force on its occupants.		
RunwayBlastPad	Polygon	A specially prepared surface placed adjacent to the ends of runways to eliminate the erosive effect of the high wind forces produced by airplanes at the beginning of their takeoff rolls.		
RunwayEnd	Point	The end of the runway surface suitable for landing or takeoff runs of aircraft. Runway Ends describe the approach and departure procedure characteristics of a runway threshold. The Runway End is the same as the runway threshold when the threshold is not displaced.		
RunwayLabel	Point	The bottom center position of the runway designation marking.		
RunwaySafetyAreaBoundary	Polygon	The boundary of the Runway Safety Area (RSA).		
<b>AC 150/5300-18B</b>	<b>Data Type</b>	<b>Description</b>	<b>Exclude</b>	<b>Collected New</b>
<b>Airfield</b>				
Shoulder	Polygon	An area adjacent to the edge of paved runways, taxiways, or aprons providing a transition between the pavement and the adjacent surface; support for aircraft running off the pavement; enhance drainage; and blast protection.		
TaxiwayIntersection	Polygon	A junction of two or more taxiways.		

TaxiwayElement	Polygon	Defined paths on an airport established for the taxiing of aircraft (excluding apron taxilanes) and intended to provide a link between one part of the airport and another.		
<b>Airspace</b>				
LandmarkSegment	Line	Features providing geographic orientation near the airport vicinity. The features may or may not have obstruction value. Collect geographic features of landmark value aiding in geographic orientation as individual polyline objects.		
Obstacle	Point	All fixed (whether temporary or permanent) and mobile objects, or parts thereof, located on an area intended for the surface movement of aircraft, penetrating an Obstruction Identification Surface (OIS), or selected as a representative object. Use this feature for modeling linear objects as obstacles.		
ObstructionArea	Polygon	Polygon features penetrating the plane of the obstruction identification surface (OIS) or selected as representative objects. Determine the type of obstructing area by the predominant feature within the grouped area. Penetrating groups of trees, ground, buildings, urban areas, mobile cranes, and agricultural area are the most common types of obstruction areas found within the surfaces of an Airport Airspace Analysis survey.		
ObstructionIdSurface	Polygon	A derived imaginary Obstruction Identification Surface defined by the FAA.		
RunwayProtectArea	Polygon	An area beyond the takeoff runway under control of airport authorities within which terrain or fixed obstacles may not extend above specified limits. These areas may be required for certain turbine-powered operations, and the size and upward slope of the clearway will differ depending on when the aircraft was certificated.		
<b>Cadastral</b>				
AirportBoundary	Polygon	A polygon, or a set of polygons, that encompasses all property owned or controlled by the airport for aviation purposes.		
AirportParcel	Polygon	A tract of land within the airport boundary acquired from surplus property, Federal funds, local funds, etc. Include easement interests in areas outside the fee property line as an airport parcel.		
County	Polygon	Boundary line of the land and water under the right, power, or authority of the county government.		
EasementsAndRightOfWays	Polygon	A parcel of land for which formal or informal deed easement rights exist.		
<b>Cadastral</b>				
Municipality	Polygon	Boundary line of the land and water under the right, power, or authority of the municipal government.		
Parcel	Polygon	A single cadastral unit, which is the spatial extent of the past, present, and future rights and interests in real property and the geographic framework to support the description of the spatial extent.		
State	Polygon	Boundary line of the land and water under the right, power, or authority of the state government.		
Zoning	Polygon	A parcel of land zoned specifically for real estate and land management purposes; more specifically for commercial, residential, or industrial use.		

<b>Environmental</b>				
EnvironmentalContaminationArea	Polygon	A facility or other locational entity, (as designated by the Environmental Protection Agency) that is regulated or monitored because of environmental concerns.		
FaunaHazardArea	Polygon	An area where there are hazards due to wildlife activities. This includes bird aircraft strike hazard (BASH) areas, and deer strike areas.		
FloodZone	Polygon	Areas subject to 100-year, 500-year and minimal flooding.		
FloraSpeciesSite	Point	The specific location where an individual flora species or an aggregate of flora species has been identified.		
ForestStandArea	Polygon	A forest flora community with similar characteristics.		
HazMatStorageSite	Point	A defined or bounded geographical area designated and used for the storage of contained hazardous materials.		
NoiseContour	Polygon	An area that describes the noise attributed to operations. For aircraft operations, the Day/Night average sound level (Ldn) descriptor is typically used to categorize noise levels.		
NoiseIncident	Point	A formal complaint by an individual or group regarding excessive noise resulting from airport operations.		
NoiseMonitoringPoint	Point	The location of noise sensing equipment or where a noise sample is taken.		
SampleCollectionPoint	Point	The physical location at which one or more environmental hazards field samples are collected.		
Shoreline	Polygon	The boundary where land meets the edge of a large body of fresh or salt water.		
Wetland	Polygon	Transitional lands between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. The soils are predominantly saturated with water and the plants and animals that live there are specialized for this ecosystem.		
<b>Geodetic</b>				
AirportControlPoint*	Point	A control station established in the vicinity of, and usually on, an airport and tied to the National Spatial Reference System (NSRS).		
<b>Geodetic</b>				
CoordinateGridArea	Line	A regular pattern of horizontal and vertical lines used to represent regular coordinate intervals along the x and y axis. This grid line can be used to generate an arbitrary grid system which is common on locator maps.		
ElevationContour	Line	Connecting points on the surface of the earth of equal vertical elevation representing some fixed elevation interval.		
ImageArea	Polygon	The image foot print or coverage area.		
<b>Structures</b>				
Building	Polygon	A three-dimensional structure (i.e. hangars, terminals, etc.) modeled with a bounding polygon.		

ConstructionArea	Polygon	A defined area that is under construction, not intended for active use until authorized by the concerned authority. The area defines a boundary for personnel, material, and equipment engaged in the construction activity.		
Roof	Polygon	Structure on top of buildings, garages and other similar structures.		
Fence	Line	Any fencing (chain-link, razor wire, PVC, etc.).		
Gate	Line	An opening in a fence or other type of barrier between areas.		
Tower	Point	A structure created, by man, to facilitate an activity at an elevated level above the ground.		
<b>Navigational Aids</b>				
NavaidCriticalArea	Polygon	A zone encompassing a specific ground area in the vicinity of a radiating antenna array which must be protected from parking and unlimited movement of surface and air traffic. The drawings included in this table are representative, be sure to refer to the official source to ensure the appropriate area is protected.		
NavaidEquipment*	Point	Any ground-based visual or electronic device that provides point to point guidance information or position to aircraft in flight.		
NavaidSite	Polygon	The parcel, lease, or right-of-way boundary for a navaid facility that is located off airport property.		
<b>Security</b>				
SecurityArea	Polygon	An area of the airport in which security measures required by 49CFR1542.201 must be carried out.		
SecurityIdDisplayArea	Polygon	Portions of an airport, specified in the airport security program, in which security measures required by regulation must be carried out. This area includes the security area and may include other areas of the airport.		
SecurityPerimeterLine	Polygon	Any type of perimeter, such as barbed wire, high fences, motion detectors and armed guards at gates, that ensure no unauthorized visitors can gain entry.		
SterileArea	Polygon	Portions of an airport defined in the airport security program that provide passengers access to boarding aircraft and to which the access is generally controlled by TSA, an aircraft operator, or a foreign air carrier.		
<b>Surface Transportation</b>				
Bridge	Polygon	A structure used by vehicles that allows passage over or under an obstacle such as a river, chasm, mountain, road or railroad.		
DrivewayArea	Polygon	An access to a residence or other vehicle parking lot or storage area.		
DrivewayCenterline	Line	The center of the driveway as measured from the edge of the paved surface. The segments of a driveway centerline will coincide with the road segments in order to provide network connectivity.		
ParkingLot	Polygon	An area of an airport used for parking of automobiles, buses, etc.		
RailroadCenterline	Line	Represents the centerline of each pair of rails.		
RailroadYard	Polygon	Represents a railroad yard.		

RoadCenterline	Line	The center of the roadway as measured from the edge of the paved surface. The segments of a road centerline will coincide with the road segments in order to have similar characteristics.		
RoadPoint	Polygon	A point along the roadway which has some special significance either for starting or ending a road segment or for representing a significant position along the roadway system such as the start or center of a bridge or the center of an intersection.		
RoadSegment	Polygon	Represents a linear section of the physical road system designed for, or the result of, human or vehicular movement; must be continuous (no gaps) and cannot branch; no mandates are provided on how to segment the road system except that data providers adopt a consistent method.		
Sidewalk	Polygon	A paved or concrete pad used as a pedestrian walkway. Usually is composed of one or more SideWalkSegments.		
Tunnel	Polygon	The area of a transportation passage, open at both ends, used to provide access through or under a natural obstacle.		

<b>DIA Utilities</b>	<b>Data Type</b>	<b>Description</b>		
<b>DEICE</b>				
DelceDripAreas	Polygon	Areas of airfield where deice fluid is known the drip.		
DelcePipelines	Line	Pipes which carry deice fluid from one area to another.		
DelcePonds	Polygon	Holding ponds for deice fluid.		
DelceTanks	Point	Holding tanks for deice fluid.		
DelceVaults	Point	Underground room providing access to subterranean deice pipelines.		
<b>DENVER WATER DISTRIBUTION SYSTEM</b>				
ACCESS_OPENING	Point	Opening used to access water distribution features.		

**TECHNICAL SPECIFICATIONS**  
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**DIA Data Center**  
**CONTRACT NO. 201207370**

BACKFLOW_PREVENTER	Point	Device used to protect water supply from contamination.		
CONDUIT	Line	Pipe or tube used to house and protect water lines.		
CONDUIT_VALVE	Point	Part of conduit which is opened or closed to control flow of water.		
CONNECTOR_LINE	Line	Lines used to connect water mains to other water distribution features.		
CONNECTOR_VALVE	Point	Part of connector which is opened or closed to control flow of water.		
DW_WELL	Point	Structure used to access groundwater.		
FIRELINE	Line	Water line used for hydrants and other fire-related features.		
FIRELINE_TAP	Point	Point which allows connection to fireline.		
FIRELINE_VALVE	Point	Part of fireline which is opened or closed to control flow of water.		
FirePoints	Point	Hydrants and other fire point features.		
FLOW_METER	Point	Instrument used to monitor rate of water flow.		
HYDRANT	Point	An apparatus which dispenses water, mainly for firefighting purposes.		
HYDRANT_BRANCH	Line	Pipe off of water main leading to hydrant.		
HYDRANT_VALVE	Point	Part of hydrant which is opened or closed to control flow of water.		
MAIN	Line	Principal water pipe.		
MAIN_VALVE	Point	Part of main which is opened or closed to control flow of water.		
MASTER_METER	Point	Device used to measure water use.		
METER_PIT	Point	Box containing water meter.		
PIPE_FITTING	Point	An item used to connect, cap, plug or otherwise alter a pipe carrying water.		
PROCESS_LINE	Line	Line used to process water.		
PROCESS_VALVE	Point	Part of a process line which is opened or closed to control flow of water.		
PUMP	Point	Device used to move water.		
STATIONING_POINT	Point	Denver Water stationing point.		
<b>DENVER WATER DISTRIBUTION SYSTEM</b>				
STOP_BOX	Point	Valve used to control the flow of water to a specific building.		
TAP	Point	Point which allows connection to water line.		
WATER_RESERVOIR_POINT	Point	The point from which water is supplied for processing and distribution.		
<b>DENVER WATER FACILITY</b>				
CASING	Line	Encasement to protect water lines.		
DW_STRUCTURE	Polygon	Water structures such as pump stations, vaults and drop structures.		
ENCLOSURE	Polygon	Denver Water enclosure.		
ENCLOSURE_ENTRANCE	Point	Denver Water enclosure entrance.		
ERT	Point			
OFFSET_VALVE_BOX	Point	Denver Water offset valve box.		

ISSUED FOR [edit]: [Date]

DIA

Revision No. May 2012

WATER_RESERVOIR	Polygon	The point from which water is supplied for processing and distribution.		
<b>ELECTRIC</b>				
ElectricOverhead	Line	A group of overhead conductors used to carry electrical energy from point to point.		
ElectricUnderground	Line	A group of underground conductors used to carry electrical energy from point to point.		
ElectricVaults	Point	Underground room providing access to subterranean electrical equipment.		
LightCircuits	Line	Light circuits.		
LightDuctbanks	Line	One or more ducts routed in parallel between two nodes.		
LightDuctbankVaults	Point	Underground room providing access to subterranean light ductbanks.		
Pole	Point	A structure used to elevate wires, cables, or other lines above the ground surface.		
SolarSites	Polygon	An area consisting of solar cell devices that convert light into energy.		
Streetlight	Point	Street lights.		
<b>OIL/GAS/FUEL</b>				
AbandonedOilWells	Point	Oil wells no longer in service.		
COGCCFacilities	Point	Colorado Oil and Gas Conservation Commission facilities.		
DIAFlowlineMID	Line	Anadarko or Magellan oil and gas flowlines.		
DIAFlowlineCPPL	Line	Conoco Phillips oil and gas flowlines.		
Flowlines	Line	Oil and gas flowlines.		
FlowlinesAsbuiltUnverified	Line	Unverified oil and gas flowlines.		
<b>OIL/GAS/FUEL</b>				
FuelFarm	Polygon	An area designated for the storage of POL products which normally includes multiple tanks (above or below ground), berms, and monitoring wells.		
FuelingStations	Polygon	Designated area to refuel vehicles.		
JetFuelManholes	Point	An opening used to access jet fuel lines.		
JetFuelPipelines	Line	Lines that carry jet fuel from one point to another.		
JetFuelPits	Point	Structure used to hold jet fuel before being pumped to aircraft.		
NaturalGasPipelines	Line	Lines that carry natural gas from one point to another.		
OilProductionDevices	Point	Oil production devices (tanks, meters, separators)		
OilWells	Point	Structure used to hold oil.		
OilWellTestSites	Point	Oil well test sites.		
WattenbergPipelines	Line	Oil and gas pipelines.		

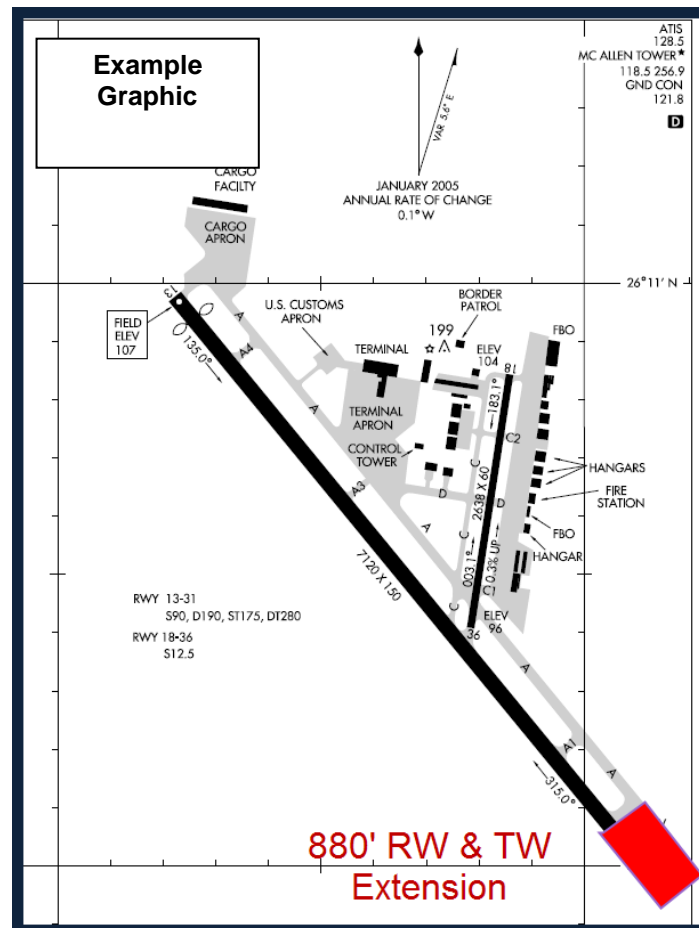



<b>SANITARY FACILITY</b>				
DIA_INF_SANCASING_L	Line	Encasement to protect sanitary lines.		
DIA_INF_SANCLEANOUT_P	Point	Pipe which allows easier access to sanitary lines for maintenance purposes.		
DIA_INF_SANFITTING_P	Point	An item used to connect, cap, plug or otherwise alter a pipe carrying sewage.		
DIA_INF_SANMAIN_L	Line	Principal sanitary sewer pipe.		
DIA_INF_SANMANHOLE_P	Point	An opening used to access sanitary lines and structures.		
DIA_INF_SANSTRUCTURE_P	Point	Sanitary sewer structures such as pump stations, vaults and drop structures.		
DIA_Sanitary_Facility_Net_Junctions	Point	A box or small vault (usually concrete, brick, or cast iron) in sanitary systems located below grade with above grade access where pipes intersect. The manhole also houses associated fittings, valves, meters, etc.		
<b>STORM FACILITY</b>				
DrainageCleanouts	Point	Pipe which allows easier access to storm lines for maintenance purposes.		
DrainageManholes	Point	An opening used to access drainage structures.		
DrainagePipelines	Line	Pipelines used to drain storm water.		
PWWMD_BND_STMDETENTION_A	Polygon	Area to temporarily hold storm runoff while slowly draining to another location.		
PWWMD_BND_STMEASEMENT_A	Polygon	Limited property rights allowing land to be used for storm facilities.		
PWWMD_INF_STMCASING_L	Line	Encasement to protect storm lines.		
PWWMD_INF_STMCLEANOUT_P	Point	Pipe which allows easier access to storm lines for maintenance purposes.		
PWWMD_INF_STMFITTING_L	Point	An item used to connect, cap, plug or otherwise alter a pipe carrying storm water.		
<b>STORM FACILITY</b>				
PWWMD_INF_STMINLET_P	Point	Entrance point for storm water to avoid an obstacle ie flow under a road.		
PWWMD_INF_STMLOGNATION_JUNCTION_P	Point			
PWWMD_INF_STMMAIN_L	Line	Principal storm sewer pipe.		
PWWMD_INF_STMMANHOLE_P	Point	An opening used to access storm lines and structures.		
PWWMD_INF_STMOUTFALL_P	Point	Discharge point for storm water to avoid an obstacle ie flow under a road.		
PWWMD_INF_STMPIPEDIR_L	Line	Line indicating storm water flow.		
PWWMD_INF_STMSERVICELINE_L	Line	Storm sewer service lines.		
PWWMD_INF_STMSTRUCTURE_P	Point	Storm sewer structures such as pump stations, vaults and drop structures.		
PWWMD_INF_STMTAP_P	Point	Point which allows connection to storm water line.		
PWWMD_NAT_STREAMNETWORK_L	Line	Stream network used for the draining of storm water.		
StormDrainageBasins	Polygon	Structure which holds drained storm water.		
<b>TELECOM</b>				

Antenna	Point	Telecom antenna.		
CallBoxes	Polygon	Call boxes used for roadside emergencies.		
CommunicationLines	Line	Telecom lines.		
CommunicationLinesFAA	Line	FAA telecom lines.		
CommunicationVaults	Point	A special structure for transitioning the outside cable plant from horizontal orientation to vertical orientation in preparation for termination on the distribution frame.		
CommunicationVaultsFAA	Point	A special structure for transitioning the outside cable plant from horizontal orientation to vertical orientation in preparation for termination on the distribution frame (FAA).		
FAAtext	Point	FAA feature labels.		

### Location Sketch

SOW location sketch must show the location of the area where work is being conducted along with the location of DIA's NSRS Permanent Identifiers (PID). PID locations should be labeled with the NSRS name.



 <p><b>DENVER INTERNATIONAL AIRPORT</b></p> <p><b>Contractor's</b></p> <p><b>Survey Quality Control Plan</b></p>	Contract Name:		
	Contractor:		
	From MXX	To M XX	Year xxxx
	Contract No.:	Date:	
	AIP No.		
	Prepared by:	Report No.:	
Weather: <input type="checkbox"/> Sunny <input type="checkbox"/> Fair <input type="checkbox"/> Cloudy <input type="checkbox"/> Rain _____ inches <input type="checkbox"/> Snow _____ inches Max. Wind: _____ mph Max/Min Temp. _____ deg F/ _____ deg F			

### SURVEY QUALITY CONTROL PLAN FORM

#### GENERAL

This Survey and Quality Control Plan Template is for projects which will result in some revision to data included in the current Electronic Airport Layout Plan (eALP). Data updates will contain both safety critical and non-safety critical data which DIA will submit to the FAA Office of Airports, Airport Surveying-GIS Program. Items highlighted in blue are to be filled out by the Contractor based on the bid proposal scope. **Items highlighted in blue are to be filled out by Contractor when stipulated by your DIA Project Manager based on a case-by-case determination depending on project location, project scope, and project impact to the electronic Airport Layout Plan. This is not mandatory unless stated so by the DIA Project Manager overseeing the project bid proposal prior to project award.**

All text highlighted in blue are examples and should be replaced by the Consultant.

#### SAMPLE TEMPLATE

##### Administrative

Date: January 1, 2011

Airport Contact: Mr. Mark Gibbs  
Senior Airport Planner  
Airport Office Building  
8500 Pena Boulevard  
Denver, CO 80249-6340  
Telephone 303.342.2692  
FAX 303.342.2617  
Mark.gibbs@flydenver.com

Airfield Emergency Contact Airfield Operations – 303.342.4211  
Airfield Escort Airfield Construction Manager – 303.342.4876

Prepared by: Consultant  
Consultants, Inc.  
Somewhere, USA 76137-0610  
Phone: 555-555-5555  
Email Address: JohnDoe@ConsultantsInc.com

Project Title: Commonly Referenced Project Name  
Planned Start Date: Expected Start Date  
Estimated Completion: Expected Completion Date (or number of days)

## Project Summary

This section should describe the WHAT and WHY of the project. It should list the information from the statement of work describing what data is to be collected. This section should also describe the why the data is being collected. Is the survey part of a larger project such as runway construction, runway safety area improvement etc. or is it specifically to collect and analyze objects for obstruction analysis?

## Field Survey

This section defines the project by identifying how the Contractor proposes to complete the field collection portion of the project. What method, tools and techniques they will use in the field to determine or verify the position of objects. This section should tell the story as how the Contractor sees the project from start to finish in detail. What stations they expect to occupy to observe different features, what techniques they will use to make the observations etc.

Delete any statements/paragraphs that do not apply to this survey. Not all of these apply to a single project survey. The Airport has provided a template example that is exhaustive of current technology and survey practices. This is meant as a guide and each Contractor may choose their survey technology based on their business needs.

## Examples of Field Survey

### Field Survey Preparation and Planning:

Prior to commencing field survey operations, Contractor will prepare an Airport Data Sheet to be used by both office and field survey personnel. The form will contain all pertinent airport header (communications and location) information and project control data. This information provides the project team with the basic information to conduct the survey.

### Field Personnel Safety:

All work within the Airport Operations Area will be coordinated with Airport Operations no fewer than five working days prior to the date such work is to begin. Site safety and coordination training will take place prior to the start of field activities. Clearly identified company vehicles with integrated safety lighting will be employed to move on and around the airport. Field personnel will wear 'safety yellow' or 'orange' vests shirts or sweatshirts in accordance with the latest federal work zone safety requirements (ANSI 107-1999) and FAA Advisory Circular AC 150/5370-2E, Operational Safety on Airports during Construction. Field personnel will be escorted by a Red Stripe Badge employee while working in the AOA.

### Project Control:

Contractor must contact the DIA Survey Office to discuss project control prior to beginning work. Based on the results of the discussion, Contractor will attempt to recover previously established project control points and DIA control monuments identified in the statement of work or by the DIA Survey Office. Survey measurements will be made to ensure the unmodified condition of any existing points that will be used in construction or as-built surveys and to position any new temporary control points that may be required to complete the project. Such measurements will include ties to at least three DIA Control Monuments (these monuments will serve as both horizontal and vertical control). Measurement data will be adjusted holding fixed the NGS published positions and elevations of the DIA Control Monuments. Measurement data and adjustment results will be submitted to the DIA Survey Office for review and approval prior to beginning

work on the project. If the control check survey reveals problems with project control points or DIA Control Monuments, the DIA Survey Office will identify a remedy that ensures FAA and Airport standards are met.

#### **Static Global Navigation Satellite Systems (GNSS) Observations:**

Static GNSS observations will be conducted on the airport features or survey control stations requiring a relatively high degree of accuracy or when other survey techniques cannot be effectively employed. GNSS data will be collected with geodetic grade GNSS receiver and antenna systems mounted on a tripod or fixed height rover pole. The simultaneous collection GNSS observations at instrument locations produce geodetic vectors connecting the points. The occupation time at each station will vary and are dependent on the desired accuracy level, vector length and GPS constellation status. NGS or FAA station recovery format and observation logs will be completed for all static observations. A minimum of three photographs will be taken, one of each type described in AC-18B, at each control monument. The observation data will be post-processed in the office to generate vectors. These vectors will then be adjusted using a least squares adjustment process.

#### **Static GPS Quality Control Measures:**

- A. Standardization of Equipment: Contractor will minimize the potential for configuration and processing error by using consistent equipment types.
- B. Equipment Calibration/Inspection: Prior to GNSS static observations, each fixed height tripod intended to be used will be calibrated to eliminate potential blunders in height and centering error. Tribrachs used on adjustable height tripods will be adjusted to ensure accurate centering and leveling. GNSS receivers, antennae and connecting cables will be inspected for defects or damage. Faulty equipment will be removed from the working equipment inventory.
- C. Field Tripod Checks: Throughout static GNSS observations, fixed height tripods will be checked for true vertical (plumb). External factors such as passing aircraft, unstable soil, or high wind can contribute to plumb drift during a survey. When drifting is detected, the instrument will be re-plumbed if the drift is minor. If more severe drift is observed the session will be aborted and restarted after corrections have been made to the equipment. Severe drift occurs when more than half of the level bubble moves outside of center circle on the circular level vial.

#### **Real Time Kinematic (RTK) GNSS Method:**

RTK GNSS observations will be made with geodetic grade survey equipment with a static base station and a roving GNSS receiver connected by a special data radio or by cellular phone modem. The base station equipment will be set over a control station with known position and elevation – (these control points must be a NGS survey point). GNSS data from the base station are transmitted to the roving receiver at a minimum rate of once per second and the base-to-rover vector and resultant rover position are computed at the rover in near real-time. Observation times are determined by the required accuracy. Redundant observations consisting of at least 180 epochs will be made to any point with an accuracy requirement of 0.3 foot or less. Vector quality data will be recorded on these redundant observations. Typically, there is no post-processing of RTK GNSS data.

#### **Real Time Kinematic (RTK) GNSS Method using Continuously Operating Reference Station (CORS) or Virtual Reference System (VRS):**

RTK GNSS observations will be made with geodetic grade survey equipment. The base, or reference station data will be supplied by agency and network/station name. The base station position and elevation are continuously monitored by agency. The CORS or VRS must transmit GNSS data at a minimum rate of once per second. The roving GNSS receiver is connected to the base by a special data radio or by cellular phone modem. GNSS data from the base station are transmitted to the roving receiver and the base-to-rover vector and resultant rover position are computed at the rover in near real-time. RTK GNSS sessions using CORS or VRS will be site-calibrated daily to a minimum of three horizontal and four vertical DIA Control Monuments or other control approved by the DIA Survey Office. Site calibration points will be occupied for a minimum of 180 epochs. Typically, there is no post-processing of RTK GNSS data.

**RTK Quality Control Measures:**

- A. **Standardization of Equipment:** Contractor will minimize the potential for configuration and processing error by using consistent equipment types.
- B. **Control Check Observations:** Potential errors are minimized by making systematic control check observations at regular, frequent intervals throughout the day. While surveying features, field teams will observe known project control and available NGS Monuments and compare the resultant coordinates to each station's published position. This check verifies the continued accuracy of the equipment setup and identifies possible problems before they degrade the accuracy of the survey.
- C. **Redundant Measurements:** Redundant observations are obtained on features with an AC-18B accuracy requirement of less than 0.3 feet.

**Traditional Angle and Distance Method:**

A traditional angle/distance survey includes horizontal and vertical angles and slope distances to each object. Distances may be measured with a tape, laser or electronic distance measurer. Measurements will be made using a total station surveying instrument or a hand-held EDM when necessary. Angle and distance measurements may be post-processed or processed in the field using a field computer/data collection device. Angular and distance measuring equipment are serviced based on manufacture specifications and calibrated annually.

**Traditional Angle and Distance Quality Control Measures:**

- A. **Angular Orientation Checks:** Proper angular orientation while occupying a known station will be verified by measuring to the backsight and an additional existing control station. The crews will turn angles and measure distances to known stations at the beginning and end of each setup to confirm that setup's accuracy. Survey calculations will be performed daily to verify the integrity of the survey.
- B. **Electronic Distance Meter or Measurement (EDM) Check:** Electronic Distance meters are checked by measuring distances between points with known coordinates and comparing the results from the EDM equipment with distances calculated from coordinates. Where no such known points exist, EDM will be checked by measuring a distance between two temporary points then resetting the instrument on-line between the points and measuring to each temporary point. The sum of these two distances is compared to the direct measurement to confirm the EDM is correctly calibrated.
- C. **Elimination of Systematic EDM Errors:** Virtually all modern EDM devices are capable of correcting for external environmental conditions (atmospheric pressure, temperature, refraction, and earth curvature). Weather conditions or correction factors calculated from weather conditions will be updated in the survey device at each setup. The manufacturer offset for the target prisms is entered into the EDM device at the beginning of the survey and whenever the target type is changed.

**Differential Leveling Method:**

Differential leveling may be used to establish or verify elevations on features or project control points. Leveling will be conducted to meet NGS Third-order specifications. These specifications can be found at <http://www.ngs.noaa.gov/heightmod/Leveling/requirements.html>. Leveling will start at a point of known elevation and end at a different point of known elevation. Optical or digital instruments may be used. If optical instruments are employed, complete records of observations, including backsight and foresight distances, and full descriptions of leveled points will be recorded in field notes.

**Differential Leveling Quality Control Measures**

- A. **Adjustment of Level instrument:** A peg test will be completed and the results documented in the field notes at the beginning of each day that leveling occurs.
- B. **Balanced Sights:** Backsight and foresight distances will be balanced within 33 feet on each setup. The total imbalance on a section of level line shall not exceed 33 feet.

- C. Multiple Rod Procedure: When two level rods are employed, the rod used for the initial observation at the starting point will be used for each new/existing point for which an elevation is to be established/verified.
- D. Loop Misclosure: Misclosure in a section of leveling will not exceed 12mm times the square root of the one-way route distance between marks in kilometers, or 0.05 foot times the square root of the one-way route distance in miles

#### Methodology Summary:

The survey focus is on the accuracy required for each feature class. The appropriate technique will be applied to attain the required accuracy while maximizing efficiency and minimizing the impact on airport operations and construction activities. Unforeseen field conditions may require some modification of the procedures detailed above. Any modified procedure will ensure that accuracy requirements for the feature are met and will be documented in the final report.

#### Geodetic Control

Describe the plan for verifying connection of this survey to the National Spatial Reference System (NSRS) and how airport control will be used during the survey. This section continues the discussion of the project by detailing how the field teams will use the established permanent geodetic control or set temporary control stations to complete the project.

#### Example of Geodetic Control:

All geospatial data submitted to the FAA will be based on North American Datum of 1983, NSRS 2007 (NAD83 (2007)) adjustment and North American Vertical Datum of 1988 (NAVD88- GEOID 09) The AC-18B requirement to tie all data directly to the PACS and SACS has been modified to allow ties to any NSRS-published Airport control monument. Large Airport Airfield Construction Projects referenced in 3.02.A. 1 would need to be also tied to Airport PACS and SACS Points.

Contractor will submit a recovery form for any NSRS station which has not had a recovery submitted within the prior 12 months or if the station condition or description has changed since the last recovery.

These include:

Station Name	PID	Type
DVX	AA0000	HV
DR	BB1111	HV
Name	CC2222	HV

Type Code H=Horizontal, V=Vertical, HV=Horizontal and Vertical

#### Imagery

This section describes the HOW the project will be completed. Note that not all project will require imagery. In this section the Contractor should describe in detail how they will use the imagery collected for the project. It should describe what parts of the project will use the imagery for data collection or analysis. It should describe in detail how airport features, such as airport buildings, aircraft movement areas, landmark features, obstruction area limits and other planimetric information will be collected within the required horizontal and vertical accuracies.

#### Existing Data

This section continues the discussion of the project by detailing how it will be used to meet the requirements of the project. The Contractor should provide information regarding the source, traceability and quality of the data.



## Data Processing

This section completes the project how discussion of the data collection by providing information on the tools techniques and processes the Contractor will use to post process, reduce, and collate the data to produce the final deliverable required.

### Example of Data Processing

Contractor will process the field survey data using the software listed in the following table:

Application	Name	Manufacturer	Version
Field Data Collection	Survey Controller	Trimble	11
GNSS Data Processing	Trimble Business Center	Trimble	2
Survey Adjustments	ADJUST	NGS	5.6
CAD	AutoCAD	Autodesk	10
GIS	ArcGIS	ESRI	10
Spreadsheet	Excel	Microsoft	2007
Word Processing	Word	Microsoft	2007
Other	Software	Used	Herein

## Listing Equipment

Provide a complete listing of the equipment to be used in the survey, including model and serial numbers, calibration reports, and equipment maintenance reports. This will include field survey and remote sensing hardware and software.

### Example of Data Processing

The following equipment anticipated to be used in this project:

Type	Model	Manufacturer	Serial Number
GNSS Receiver	R8 Model 3	Trimble	123456
GNSS Receiver	4700	Trimble	654321
GNSS Antenna	Zephyr Geodetic 2	Trimble	456789
Total Station	5603 DR200+	Trimble	987654
EDM	LRB 4000CI	Optik	1a2b3c4
Data Collector	TSC2	Trimble	456123
Digital Level	NA2002	Leica	321654
Computer	M4500	Dell	12345z98765

Equipment is calibrated annually or as recommended by the manufacturer. Field calibration checks are performed daily through measurements to or between points with known position and elevation. Pertinent calibration reports are attached.

## Quality Assurance

In this section describe HOW the Contractor proposes to ensure the collection and delivery of quality data meeting the requirements. At a minimum, discuss the following for each of the items in each of the following sections:



- I. Describe the quality control measures that will be in place to ensure that all data will be checked, complete, and reliable and meet the accuracy requirements in these General Specifications (including error analysis).
- II. Describe and provide samples of the evidence that will demonstrate how methods used to collect the various types of features met the desired accuracies.
- III. Describe the data back up and archive procedures and methods to be used to ensure that the original data will not be modified.
- IV. Describe and explain the method that will be used to check all file formats and a summary of the file-naming convention for all electronic files.
  - A. Field Operations: This section should detail what tools, techniques and processes the field team will use to ensure the collection of quality data. It should describe how the field data will be validated to ensure all the required information was determined including any required attribution. It should discuss how and when will be transferred to office personnel for reduction and analysis.
  - B. Remote Sensing: This section should describe how the combination of remote sensing and ground surveying techniques will be used to accomplish the survey and how the results will be compared. It should also describe how potential discrepancies between the remote sensing and ground survey will be resolved.
  - C. Office Operations: This section should describe the quality assurance of the field and office operations as they are combined to produce the final dataset.

#### Quality Assurance Example

Contractor intends to perform all survey and mapping operations using industry standard methods to ensure FAA is receiving an accurate and complete product meeting the requirements of AC-18B. The following checklist will be employed to ensure that the data collection efforts are successful.

#### Pre-mobilization Preparation

- ☐ Possess all appropriate contact information for making contact with client on questionable issues
- ☐ Possess all appropriate contact information on Airport and ADO personnel
- ☐ Field crews must possess Advisory Circulars 15/5300-16A, 15/5300-17B and 15/5300-18B
- ☐ Field crews must possess latest copy of the SOW
- ☐ Field crews must possess SW/QC Plan, and approved Safety Plan
- ☐ Field crews must possess all existing project data, (NGS Data Sheets) and DIA LDP coordinates and projection
- ☐ Field crews must possess all existing project layout data

#### Planning and Reconnaissance Activities

Airfield safety is the top priority and safety issues, emergency procedures and airfield communications will be thoroughly reviewed with the DIA Operations and other appropriate staff before beginning any field operations. Mark reconnaissance is the most important field task when beginning the project. Missing or disturbed control points will be immediately reported to the DIA Survey Office at 303.342.4428. The Survey Office will identify suitable alternate control.

Airfield Emergency Contact – Airport Operations – 303-342-4211

#### Airport Facility

- ☐ Identify all safety concerns and communication protocol with airport
- ☐ Meet with DIA Survey Office to obtain latest control updates

#### Project/Airport Control Recon

- ☐ Recover existing NGS Monuments Established at DIA
- ☐ Recover existing project control stations

- ☐ Capture all pertinent photos (as defined in AC 150/5300-16)
- ☐ Complete a thorough Station Recovery Log sheet for all stations

#### Post Airport Control Recon

- ☐ Report all updated recovery information for NSRS points via NGS website

#### Survey Observations

Multiple surveying methods will be used to complete the survey. As the primary vehicle for positioning, GNSS technology will be widely implemented during this project. Traditional methods will be used when cost effective. Field surveyors will perform a review and preliminary analysis of the data to determine its accuracy and completeness. Observations found to be of poor quality will be repeated and collection of omitted features or attributes will be added to future work schedules.

#### Static GPS

- ☐ Observation times dependent on required accuracy and baseline length
- ☐ Complete GPS log sheet for all observations
- ☐ Set GPS receivers to a 15° elevation mask
- ☐ Utilize ground planes, if antenna has one, for all control observations
- ☐ Utilize fixed height tripods or rover poles for all observations to minimize instrument height errors
- ☐ Inspect and calibrate plumb of fixed-height tripods and rover poles prior to observations
- ☐ Verify fixed-height tripod height prior to all sessions
- ☐ Monitor receiver during all session to ensure uninterrupted and good quality GPS data
- ☐ Capture require digital photographs for specific station types

#### RTK GPS

- ☐ Create a new observation file on a daily basis
- ☐ Set Base station PDOP mask to 5.0
- ☐ Set Base station antenna mask for 15°
- ☐ Set Base station RMS limits to 0.20
- ☐ Set Base station transmit interval to one second.
- ☐ Set Base station to collect "IN-FILL" data for the duration of full day at 15-second epochs
- ☐ Periodically check base station for plumb and battery power supply
- ☐ Regularly make and record check observations on existing control
- ☐ If CORS or VRS are used, complete a daily site calibration to three DIA horizontal and four DIA vertical control monuments

#### Angle and Distance Method

- ☐ Create a new observation file on a daily basis
- ☐ Record all instrument and target heights
- ☐ Check instrument elevation by reducing recorded observations to backsight and one other control station prior to collecting data
- ☐ Check orientation by reducing recorded observations to at least one control station in addition to the backsight prior to collecting data
- ☐ Periodically check instrument for level
- ☐ Regularly make and record check observations on existing control
- ☐ Record observations to the stations used in the elevation and orientation checks at the end of each set-up
- ☐

#### Differential Leveling

- ☐ Create a new observation file on a daily basis
- ☐ Perform and record a peg test on the level prior to each day of leveling
- ☐ Include at least two control points with published elevations in each level run
- ☐ Balance backsight and foresight distances
- ☐ If an optical level is used, record distance observations to backsight and foresight along with rod readings

- ☐ When two rods are employed, the rod used for the initial observation is used for observations on newly established vertical control points

### Data Analysis

Effective processing of the survey data is accomplished through these tasks.

- ☐ All raw data segregated to appropriate raw data directories
- ☐ All photos captured renamed and stored in proper directories
- ☐ All data backed up on alternative media i.e. Compact Disc, flash memory, online site
- ☐ A thorough station description update for all NSRS control marks recovered is submitted online through the NGS Mark Recovery Form
- ☐ Data is verified for accuracies and completeness
- ☐ All data processed and adjusted utilizing the latest version of the appropriate software
- ☐ Adjusted data and review to ensure statistical results meet required accuracy in accordance the AC guidance
- ☐ Data evaluated to assure compliance with applicable DIA standards

### Data Format

The final required section should describe how the field and office data are combined into a final data set for delivery. It should discuss what software will be used to develop the data set and how the data, features and feature attribution will be compiled.

### Other Information (Optional)

In this section of the plan discuss any information the Contractor feels is relevant to the project that is not described elsewhere in the plan. One potential use of this section is to describe potential challenges for the data collection efforts and how the Contractor proposes to reduce or mitigate these challenges.

### Example

Contractor will submit weekly project status reports to the Project Manager. Please see Form on Weekly Project Status Reports. These reports are only if required and specifically advised on the technical specifications for the project. Not all projects require Weekly Status Reports. Please see the Project Manager to see if this is a requirement for your project. The report forms will contain progress updates and any significant issues with the project including deviations from the planned schedule.

## 1.0 Project Checklist

Step	Yes	No	N/A	Project Kickoff Phase
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA PM contact Tzvetanka Panayotova, (303) 342-2362 to ensure their project is on the <b>P&amp;D Sharepoint Master Project List</b> ? This will also prompt the creation of a Project Sharepoint Folder for all Project Related documents for contacts (formerly called eDOCS)
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA PM get a project folder created on P&D Sharepoint through Dave Dixon in Planning GIS? (This should be done automatically once Tzvetanka adds the project to the <b>P&amp;D Master Project Tracking List</b> .)
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the PM's project change any aspect of the airport's outside Environment? If yes, Did the DIA PM provide Planning with project scope description and a map of the project location eALP survey/spatial requirements? (Use <b>ESV Mapping Exhibit Tool Set</b> to create Spatial Data Set <a href="http://diagissom01/dia_esv/">http://diagissom01/dia_esv/</a> ). If no, see the BIM Manager for requirements related to internal building standards. If this is only an internal building modification this is the end of the checklist the PM is responsible for. Please see the BIM manager for any other requirements that are set forth under that program.
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the PM's project change any aspect of the airport's outside Environment? If Did the Planning Designee provide DIA PM the following items? <ul style="list-style-type: none"> <li>a. DSM Chapter 12 for all Electronic Data Interchange Standards.</li> <li>b. Survey requirements based on project scope and location.</li> <li>c. Project checklist.</li> <li>d. AC 150/18B checklist off FAA/DIA airport features that could be impacted by project.</li> <li>e. DIA CADD .dwt template</li> <li>f. DIA CADD base data in DIA LDP coordinates that contain the most common airport reference data used in projects.</li> <li>g. DIA ESRI File Geodatabase (If Consultant/Contractor has GIS Capabilities)</li> </ul>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA PM and Planning Designee meet with Consultant/Contractor and brief them on the standards and general requirements for both data and spatial conformance?
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the Consultant/Contractor meet with Airport Survey Office to obtain airport survey control points, GPS calibration files, and airport survey training materials?
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the Consultant/Contractor perform initial project field survey of project site to collect accurate as-built in DIA LDP? Was the initial site survey submitted and approved by Airport Survey Section for spatial conformance/survey control? <b>Failure to have spatial conformance is</b>

				grounds for immediate rejection of data and all work associated to create the data and notification to PM manager on failure to conduct survey properly.
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### End of Kick Off Phase Checklist

**ONLY APPLIES TO PROJECTS WHICH AFFECT THE AIRPORT ENVIRONMENT OUTSIDE OF EXISTING BUILDINGS. IF THE PROJECT IS COMPLETELY CONTAINED WITHIN AN EXISTING BUILDING THIS DOES NOT APPLY. PLEASE SEE BIM MANAGER FOR GUIDANCE.**

Step	Yes	No	N/A	Design Phase
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the Consultant/Contractor provide the DIA PM with 30% project design data in CADD or GIS formats including all attribute information and metadata to date?
9a	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA PM upload 30% design data to the project folder?
9b	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA GIS section perform a 30% design data conformance QA check?
9c	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA GIS section report findings via email to DIA PM and PM manager?
9d	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If applicable (when PM's project fails 30% DIA QA data conformance check), did the Consultant/Contractor provide the DIA PM with 60% project design data in both CADD and GIS formats including all attribute information and metadata?
9e	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If applicable, did the DIA PM upload 60% design data to the project folder?
9f	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If applicable, did the DIA GIS section perform a 60% design data conformance QA check?
9g	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If applicable, did the DIA GIS section report findings via email to project manager and PM's Manager?
9h	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the Consultant/Contractor provide the DIA PM with 90% project design data in both CADD and GIS formats including all attribute information and metadata?
9i	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA PM upload 90% design data to the project folder?
9j	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA GIS section perform a 90% design data conformance QA check?
9k	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA GIS section report findings via email to PM and PM's Manager?
10a	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the Consultant/Contractor provide the DIA PM with IFC / 100% design data in CADD or GIS formats including all attribute information necessary for data transfer from CADD to GIS. This includes annotation, proper use of layer schema, and any tabular data.
10b	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA PM upload IFC / 100% design data to the project folder?

10c	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA GIS section perform IFC / 100% design data conformance QA check?
10d	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA GIS section report findings via email to DIA PM and PM's Manager?

### End of Design Phase Checklist

**ONLY APPLIES TO PROJECTS WHICH AFFECT THE AIRPORT ENVIRONMENT OUTSIDE OF EXISTING BUILDINGS. IF THE PROJECT IS COMPLETELY CONTAINED WITHIN AN EXISTING BUILDING THIS DOES NOT APPLY. PLEASE SEE BIM MANAGER FOR GUIDANCE.**

Step	Yes	No	N/A	Construction Phase (As-Built)
11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Does the PM's project change any aspect of the airport's outside Environment? If yes, Did the DIA PM provide Planning with project scope description and a map of the project location for 7460 determination and eALP survey/spatial? (Use ESV 7460 Tool To create Spatial Data Set <a href="http://diagissom01/dia_esv/">http://diagissom01/dia_esv/</a> ). If no, see the BIM Manager for requirements related to internal building standards. If this is only an internal building modification this is the end of the checklist the PM is responsible for. Please see the BIM manager for any other requirements that are set forth under that program.
12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA survey department collect utility data, including Denver Water and Excel Energy utilities, which were exposed during the project?
13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the Planning Designee provide the DIA PM the following items from the Design Phase (amended if project scope change)? Planning will determine if FAA Reporting Requirement apply to Project Scope with cooperation from PM. <ul style="list-style-type: none"> <li>a. Electronic Data Collection and Interchange Standards</li> <li>b. Survey requirements based on AGIS SOW (if required)</li> <li>c. DSM Chapter 12 for all Electronic Data Interchange Standards.</li> <li>d. Survey requirements based on project scope and location.</li> <li>e. Project checklist.</li> <li>f. AC 150/18B checklist off FAA/DIA airport features that could be impacted by project.</li> <li>g. DIA CADD .dwt template</li> <li>h. DIA CADD base data in DIA LDP coordinates that contain the most common airport reference data used in projects.</li> <li>i. DIA ESRI File Geodatabase (If Consultant/Contractor has GIS Capabilities)</li> </ul>
14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA PM provide information to complete the FAA AGIS SOW and SQCP from the Contractor ( <b>If required</b> )

15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the FAA approve the AGIS SOW? (if required) (If no, project cannot proceed until FAA approves amended plan)
15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Each week did the DIA PM forward a FAA Project Status Report during the construction process to Mark Gibbs in DIA Planning for upload to the FAA AGIS portal? (if required)
16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the Contractor provide the DIA PM with 30% As-Built data in both CADD and GIS formats including all attribute information and metadata?
17a	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA PM upload 30% as-built data to the project folder?

Continue.....

Step	Yes	No	N/A	Construction Phase (As-Builts)
17b	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA GIS section perform a 30% as-built data conformance QA check?
17c	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA GIS section report findings via email to PM and PM's Manager?
17d	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA survey department randomly sample as-built site plans for Survey Conformance?
17d	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If applicable, did the Contractor provide the DIA PM with 60% as-built data in both CADD and GIS formats including all attribute information and metadata?
17e	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If applicable, did the DIA PM upload the 60% as-built data to the project folder?
17f	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If applicable, did the DIA GIS section perform a 60% as-built conformance QA check?
17g	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If applicable, did the DIA GIS section report findings via email to DIA PM and CMC?
17h	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If applicable, did the DIA Survey department randomly sample as-built site plans for Survey Conformance?
17i	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the Contractor provide the DIA PM with 90% as-built data in both CADD or GIS formats including all attribute information and metadata?
17j	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA PM upload the 90% as-built data to the project folder?
17k	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA GIS section perform a 90% as-built conformance QA check?
17l	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA GIS section report findings via email to the DIA PM and PM's Manager?
18a	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the Contractor provide the DIA PM with 100% as-built data in both CADD or GIS formats including all attribute information and metadata?
18b	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA PM upload 100% As-Built data to the project folder?



18c	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA GIS section perform a 100% as-built data conformance QA check?
18d	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA GIS section report findings via email to the DIA PM and PM's Manager?
18e	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the DIA Survey department randomly sample as-built site plans at 100% to ensure compliance and a final approval of the site as-built?
18f	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Did the FAA approve the eALP update? (if no, this could affect future AIP/PFC and Dave Rhodes will be informed of the issues and possible remediation.)

**End of Construction Phase Checklist**

**All boxes in yellow are FAA Mandated Reporting Requirements for All AIP/PFC projects and other projects that meet certain criteria (Planning can**

EN  TION



## SECTION 01 35 25

### CONSTRUCTION SAFETY

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. Work specified in this Section includes construction safety precautions and programs by the Contractor and the basis for reviews by the Project Manager.

##### 1.02 RESPONSIBILITY

- A. The General Conditions make it clear that all safety precautions during the construction process are the responsibility of the Contractor. The Contractor is responsible for the health and safety of his employees, agents, subcontractors and their employees, and other persons on the worksite; for the protection and preservation of the work and all materials and equipment to be incorporated therein; and for the worksite and the area surrounding the worksite. The Contractor shall take all necessary and reasonable precautions and actions to protect all such persons and property.
- B. This Section shall be interpreted in its broadest sense for the protection of persons and property by the Contractor and no action or omission by the Project Manager or his authorized representatives shall relieve the Contractor of any of its obligations and duties hereunder.

##### 1.03 SUBMITTAL

- A. Refer to Technical Specifications Section 01300 and 01340 for the process. A safety plan shall be submitted and approved under the general contract prior to commencing any work. If a Task Order is issued where the work is not covered by the approved safety plan then a revision to the plan specific for the work in the task order shall be resubmitted for approval.  
NOTE: NO PROGRESS PAYMENT SHALL BE APPROVED UNTIL THE SAFETY PLAN HAS BEEN ACCEPTED BY THE PROJECT MANAGER.

##### 1.04 PROJECT MANAGER'S REVIEW

- A. Provide a Contractor's Operational Safety Plan as described below and in Part 1 of this Technical Specifications Section 01 35 25.
- B. The Contractor shall provide six copies of its Operational Safety Program to the DIA Project Manager for review at least ten calendar days before on-site construction begins. The Contractor's program must meet, as a minimum, all applicable federal, state and local government requirements.
  - 1. The Contractor must, as part of the Contractor's safety program, submit six copies of the following information for acceptance by the DIA Project Manager prior to the commencement of construction activities. The Safety Plan must address all aspects listed below. If an item is not applicable, this must be noted in the Safety Plan.
    - a. Name of the Contractor's site safety representative.
    - b. If the Contractor is running multiple shifts or working more than 40 hours per week, the name of an assistant site safety representative who can act in the absence of the site safety representative.
    - c. Twenty-four hours per day emergency phone numbers of Contractor site

- management to be used in case of injury or accident. Provide at least four contacts.
- d. The Contractor's method of ditching and trenching excavation to be used including how slopes will be stabilized with calculations showing the slope stability. The Contractor shall also show how material will be stored beside the excavation. Stored material will include the excavated and backfilled material.
  - e. How injuries or accidents will be handled including samples of the forms used to report injuries or accidents.
  - f. How employees will be handled who are unable to safely perform their duties, including how the Contractor will determine whether an employee is unable to safely perform his duties.
  - g. How and when equipment will be checked to see that it is safe, that all safety guards are in place, and that the equipment is being used for its designed purpose and within its rated capacity.
  - h. How and when all electric devices will be checked for proper grounding and insulation. Describe the methods that will be used to lock out electric systems that should not be energized.
  - i. How trash and human organic waste will be disposed of.
  - j. How snow and ice will be removed by the Contractor in his project area.
  - k. How concrete forms will be anchored to ensure their stability, including calculations showing that the forms will safely hold the maximum construction loads.
  - l. How flammable materials will be stored and handled, and how any spills will be cleaned up and removed for disposal.
  - m. What system will be used to prevent fires and, if fires do occur, who will be trained to fight them. Also, what firefighting equipment will the Contractor have available and how will this equipment's condition be monitored.
  - n. How materials will be received, unloaded, stored, moved and disposed of.
  - o. How personnel working above ground level will be protected from falling.
  - p. How people working beneath the construction work will be protected.
  - q. What will be done to protect personnel in case of severe weather.
  - r. How adequate lighting will be provided and monitored.
  - s. How air quality will be monitored to ensure that chemical exposures are below established OSHA Permissible Exposure Limits. How employees will be protected if these limits are exceeded.
  - t. How the safety of work platforms, man lifts, material lifts, ladders, shoring, scaffolding, etc. will be ensured relating to load capacity and the protection of personnel using or working around them.
  - u. The type of personal protective equipment that will be used to protect employees from hazards.
  - v. The type of safety training that will be provided to employees to inform them of safe work procedures.
  - w. How audits and inspections will be performed to ensure compliance with the Safety Plan and applicable OSHA regulations.
  - x. Procedures to ensure that welding and other hot work is performed safely.
  - y. How compressed gases will be safely stored, handled and used.
  - z. Methods to ensure that employees safely enter, work in, and exit confined spaces.
  - aa. How the hazards of chemicals will be communicated to workers, including the use of material safety data sheets and chemical labels.

- bb. Methods to ensure that forklifts and other powered industrial trucks are operated in a safe manner.
  - cc. How an effective hearing conservation program will be used to protect employees from high noise levels and prevent hearing loss.
  - dd. How employees will be protected from the effects of jet blast.
- C. Prior to the start of any work by a contractor or subcontractor employee, the Contractor shall provide the Project Manager with a list of its employees, subcontractor's employees and other personnel the Contractor has requested to work at Denver International Airport, who have signified in writing that they have been briefed on, or have read and understand, the Contractor's Safety Plan.

## **PART 2 - PRODUCTS**

### **2.01 CONTRACTOR'S SAFETY PLAN**

- A. Provide a Contractor's Safety Program as described in Part 1 of Technical Specifications Section 01 35 25.

## **PART 3 - EXECUTION**

### **3.01 IMPLEMENT CONTRACTOR'S SAFETY PLAN**

- A. Implement the approved Contractor's Operational Safety Plan as described in Part 1 of this Technical Specifications Section 01 35 25. Technical Specifications Section 01 11 10.
- B. If the Contractor experiences lost time or an injury rate greater than 75 percent of the national average for all construction, the Contractor shall audit its safety procedures and submit a plan to reduce its rates.
- C. If at any time the lost time or injury rates experienced by the Contractor are 150 percent or more of the national average for construction, the Contractor shall immediately hire an independent safety professional who shall audit the Contractor's procedures and operations and make a report of changes that the Contractor should implement to reduce the rate including changing personnel.
  - 1. Six copies of this report shall be submitted to the DIA Project Manager.
  - 2. The Contractor shall immediately begin implementing the recommendations.
  - 3. A weekly report shall be submitted by the Contractor on the status of the implementation of the recommendations.
  - 4. Failure to comply with these requirements is a basis to withhold a portion of progress payments.

## **PART 4 - MEASUREMENT**

### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

## **PART 5 - PAYMENT**

### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item.

**END OF SECTION 01 35 25**

## SECTION 01 41 00

### REGULATORY REQUIREMENTS

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. This Section identifies primary compliance with the State, City and County of Denver's regulatory requirements including:
  - 1. City and County of Denver / Department of Aviation
  - 2. Colorado Department of Public Health and Environment
  - 3. City and County of Denver Development Services (including the Department of Public Works and Division of Wastewater Management)
  - 4. The standards which govern design and construction projects at Denver International Airport.
- B. Construction shall be based on the latest edition of the referenced codes including additions and revisions thereto that are in effect at the time of project bidding or Task Order pricing or GMP established whichever is latest and as specifically related.

##### 1.02 RELATED SECTIONS

- A. 01 57 00 – Environmental Controls: for environmental and related permitting requirements.

##### 1.03 BUILDING CODE

- A. All design and construction work shall be governed by the Building Code for the City and County of Denver, latest edition. This is based upon the International Building Code of the International Code Council with Denver Amendments to this code. Appendix N of the Denver Amendments addresses Construction of Airport Buildings and Structures. This Contract shall be based on IBC 2009 as Amended by Denver dated 2011.

##### 1.04 DENVER BUILDING DEPARTMENT

- A. For review and approval of all construction documents for compliance to the Denver building code:
  - City and County of Denver
  - Ed Kocman, Project Coordinator
  - Development Services
  - 201 West Colfax Avenue, Dept 203
  - Denver, Colorado 80202
  - Telephone 720-865-2912
  - Fax 720-865-2880
- B. The Contractor is to coordinate with DIA when obtaining building permits or information from Development Services' Project Coordinator.

##### 1.05 DENVER FIRE DEPARTMENT

- A. For review and approval of plans for compliance with the Denver Fire Department's requirements as they apply to the Denver International Airport:  
Denver Fire Department  
745 W. Colfax Ave.  
Denver, Colorado 80204  
Telephone 720-865-2833
- B. The Contractor is advised that the Denver Fire Department – Fire Prevention Bureau requires permitting for the following activities as they apply to the scope of work. The Contractor is responsible for obtaining the appropriate permits necessary to complete the work. All costs associated with this permitting and policy compliance shall be the responsibility of the Contractor. The policies all reference the International Fire Code (IFC).
1. "Hot work", which is defined as the operation of any equipment or tools that creates sparks, hot slag, or radiant or convective heat as a result of the work. This includes, but is not limited to, welding, cutting, brazing, or soldering.
  2. Use and storage of compressed gas for both temporary storage and permanent facility installation. This includes, but is not limited to, flammable gas (excluding propane-LPG), oxidizer (including oxygen), and inert and/or simple asphyxiates.
  3. Tank installation, which includes above-ground storage tanks (AST) and underground storage tanks (UST) for both temporary tanks and permanent facility installations.
- C. In addition to the above permits, the Denver Fire Department may require other permits that are associated with the specific work in the Contract Documents. Policies provided by the Denver Fire Department are meant to provide basic information for the most common conditions and situations. In any given occupancy, many other Uniform Fire Code requirements may be enforced. These should be addressed with the Denver Fire Department before construction begins and during construction with premise inspection(s). Any questions can be addressed to the Fire Prevention Bureau between 6:30 AM and 9:00 AM Monday-Friday at 720-913-8242 or -8237.

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION**

### **3.01 PERMITS AND CERTIFICATIONS**

- A. The Contractor shall maintain records on site of all permits acquired by federal, state, and local agencies. Posting of permits shall conform to requirements of the respective agencies.
- B. At the completion of any inspection by other agencies, the Contractor shall forward copies of the status of the inspection and copies of any approved or "signed-off" inspections by the respective agencies to the Project Manager.
- C. At the time of request for Substantial Completion, the Contractor shall forward to the Project Manager all permits approved by the respective agencies.

## **PART 4 - MEASUREMENT**

### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

## **PART 5 - PAYMENT**

### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item.

**END OF SECTION 01 41 00**

## SECTION 01 42 20

### ABBREVIATIONS AND SYMBOLS

#### PART 1 - GENERAL

##### 1.01 REFERENCE LIST

- A. Documents published by the following agencies may be referenced within these Contract Documents to define the quality of materials, equipment, workmanship and other features of work. Unless otherwise stated, the reference documents shall be of the latest edition as of the date of the Advertisement for Bids.
- B. Wherever used in the Contract Documents, the following abbreviations will have the meanings listed:

AALA	American Association of Laboratory Accreditation
AAN	American Association of Nurserymen
AAO	Affirmative Action Officer
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AFI	Air Filter Institute
AGTS	Automated Ground Transportation System
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute, Inc.
APA	American Plywood Association
APEN	Air Pollution Emission Notes
APWA	American Public Works Association
ARI	Air Conditioning and Refrigeration Institute
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers



ASME	American Society of Mechanical Engineers
ASNT	American Society for Non-Destructive Testing
ASPE	American Society of Plumbing Engineers
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
AWPA	American Wood Preserver's Association
AWS	American Welding Society
AWWA	American Water Works Association
BID	Building Inspection Division, Department of Public Works
BIM	Building Information Modeling
CAR	Corrective Action Report
CCD	City and County of Denver
CCR	Contractor Change Request
CCRL	Cement Concrete Reference Laboratory
CD	Change Directive
CDOH	Colorado Department of Highways or Colorado Department of Health
CDOT	Colorado Department of Transportation
CMEC	Concrete Materials Engineering Council
CN	Change Notice
CO	Change Order
COE	Corps of Engineers
CPM	Critical Path Method
CR	Change Request
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
DFD	Denver Fire Department
DIA	Denver International Airport

DOT	United States Department of Transportation
DOR	Designer of Record
DWB	Denver Water Board
EEO	Equal Employment Officer or Equal Employment Opportunity
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FHWA	Federal Highway Administration
FM	Factory Mutual Association
FS	Federal Specifications (U.S. General Services Administration)
GCC	General Contract Conditions
IAPMO	International Association of Plumbing and Mechanical Officials
IBR	Institute of Boiler and Radiator Manufacturer's
ICBO	International Conference of Building Officials
ICEA	Insulated Cable Engineers Association
IEEE	Institute of Electrical and Electronic Engineers
IES	Illuminating Engineering Society
ISA	Instrument Society of America
ITA	Independent Testing Agency
MIL	Military Specifications (Naval Publications and Forms Center)
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry
NAAB	National Association of Air Balance
NACE	National Association of Corrosion Engineers
NBS	National Bureau of Standards (now called National Institute of Standards and Technology)
NCR	Nonconformance Report

NEC	National Electric Code (NFPA 70)
NECA	National Electric Contractors Association
NEMA	National Electrical Manufacturer's Association
NESC	National Electrical Safety Code
NFC	National Fire Code (as published by NFPA)
NFPA	National Fire Protection Association
NICET	National Institute for the Certification of Engineering Technologies
NIST	National Institute of Standards and Technology
NGS	National Geological Survey
NLMA	National Lumber Manufacturers Association
NOAA	National Oceanic and Atmospheric Administration
NRMCA	National Ready Mix Concrete Association
NTP	Notice to Proceed
NVLAP	National Voluntary Laboratory Accreditation Program
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PDM	Precedent Diagram Method
PS	Product Standard of NIST (U.S. Department of Commerce)
PM	Project Manager (DIA)
QA	Quality Assurance
QC	Quality Control
RAR	Remedial Action Request
RFI	Request for Information
SC	Special Contract Condition
SDI	Steel Door Institute
SMACNA	Sheet Metal and Air Conditioning Contractor's National Association

SSPWC	Standard Specifications for Public Works Construction
TCP	Traffic Control Plan
TSA	Transportation Security Administration
UBC	Uniform Building Code (published by ICBO)
UL	Underwriters Laboratories, Inc.
UMC	Uniform Mechanical Code (published by ICBO)
UPC	Uniform Plumbing Code (published by ICBO)
USC	United States Code
WBS	Work Breakdown Structure

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**PART 4 - MEASUREMENT**

**4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

**5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item.

**END OF SECTION 01 42 20**

## SECTION 01 42 25

### REFERENCE STANDARDS

#### PART 1 - GENERAL

##### 1.01 WORK INCLUDED

- A. This Section contains a summary of industry-accepted and recognized standards published by trade associations, government and institutional organizations which are referred to in the various Sections of these specifications or elsewhere in the contract documents.
- B. Standards listed herein are included in the contract documents by this reference and become a part of the contract documents to the same extent as though included in their entirety unless specific limitations are noted in the individual Specifications sections.
- C. Listings of reference standards include name and address of the organization publishing the standard, plus the full name and designator of each of the standards referenced herein.
- D. If a publication date or edition number is listed with the reference standard, that publication date or edition number shall apply; otherwise, the publication date or edition number in effect at the contract date shall apply.
- E. Inclusion of reference standards herein does not make the Project Manager an agent of the publishing agency, nor does it obligate the Project Manager to perform inspections required by or to enforce rules or regulations contained in the reference standards.

##### 1.02 REFERENCES

- A. RELATED DOCUMENTS: General Conditions, Special Conditions, and applicable provisions of Division 1 sections apply to this Section.

#### PART 2 - PRODUCTS (NOT USED)

#### PART 3 - EXECUTION

##### 3.01 SCHEDULE OF REFERENCE STANDARDS

- A. AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO), 444 North Capitol Street, NW, Suite 249, Washington, DC 20090
  - AASHTO M 36 Corrugated Metal Pipe
  - AASHTO M216 Standard Specification for Lime for Soil Stabilization
  - AASHTO T26 Standard Method of Test for Water to be Used in Concrete
  - AASHTO T84 Specific Gravity and Absorption of Fine Aggregate
  - AASHTO T85 Specific Gravity and Absorption of Coarse Aggregate

AASHTO T103 Freeze-Thaw

AASHTO T219 Standard Methods of Testing Lime for Chemical Constituents and Particle Sizes

B. AMERICAN CONCRETE INSTITUTE (ACI) P.O. Box 19150, Redford Station, Detroit, MI 48219, (313) 372-9800

ACI 211.1 Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete

ACI 211.2 Standard Practice for Selecting Proportions for Structural Lightweight Concrete

ACI 301 Specifications for Structural Concrete for Buildings

ACI 304 Recommended Practices for Measuring, Mixing, Transporting and Placing Concrete

ACI 304.2R Placing Concrete by Pumping Methods

ACI 305R Hot Weather Concreting

ACI 306R Cold Weather Concreting

ACI 315 Details and Detailing of Concrete Reinforcement

ACI 318 Building Codes Requirements for Reinforced Concrete

(NOTE: Reference to ACI 318 may be limited to more stringent requirements of local building code)

C. AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) 1916 Race Street, Philadelphia, PA 19103, (215) 299-5585

ASTM A 27 Mild to Medium Strength Carbon - Steel Casting for General Application

ASTM A 36 Structural Steel

ASTM A 47 Malleable Iron Castings

ASTM A 82 Specification for Steel Wire, Plain, for Concrete Reinforcement

ASTM A 123 Hot-dip Galvanizing

ASTMA 184 Specification for Fabricated Deformed Steel Bar Mats for Concrete Reinforcement

ASTM A 185 Specifications for Steel Welded Wire, Fabric, Plain, for Concrete Reinforcement

ASTM A 283 Low and Intermediate Tensile Strength Carbon Steel Plates, Shapes and Bars

ASTM A 615	Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
ASTM A 706	Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement
ASTM C 25	Method for Chemical Analysis of Limestone, Quicklime and Hydrated Lime
ASTM K 29	Unit Weight of Aggregate
ASTM C 31	Methods of Making and Curing Concrete Test Specimens in the Field
ASTM C 33	Specification for Concrete Aggregates
ASTM C 39	Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C 42	Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete
ASTM C 76	Reinforced Concrete Culvert, Storm Drain and Sewer Pipe
ASTM C 88	Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C 94	Specification for Ready Mixed Concrete
ASTM C 109	Mortar Bar Test for Cement
ASTM C 110	Methods for Physical Testing of Quicklime, Hydrated Lime and Limestone
ASTM C 117	Materials Finer than 75 mm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 131	Resistance of Abrasions of Small Size Coarse Aggregate by Use of the Los Angeles Machine
ASTM C 136	Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C 138	Unit Weight, Yield and Air Content of Concrete
ASTM C 143	Test Method for Slump of Portland Cement Concrete
ASTM C 150	Specification for Portland Cement
ASTM C 171	Specification for Sheet Material for Curing Concrete
ASTM C 172	Method of Sampling Fresh Concrete
ASTM C 173	Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method

ASTM C 231	Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C 260	Specification for Air Entraining Admixture for Concrete
ASTM C 309	Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C 443	Joints for Circular Concrete Sewer and Culvert Pipe Using Rubber Gaskets
ASTM C 494	Specification for Chemical Admixtures for Concrete
ASTM C 595	Blend Hydraulic Cements
ASTM C 618	Specification for Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
ASTM C 655	Reinforced Concrete D Load Culvert, Storm Drain and Sewer Pipe
ASTM C 789	Precast Reinforced Concrete Box Sections for Culverts, Storm Drains and Sewers
ASTM C 803	Test Method for Penetration Resistance of Hardened Concrete
ASTM C 805	Test Method for Rebound Number of Hardened Concrete
ASTM C 977	Specification for Quicklime and Hydrated Lime for Soil Stabilization
ASTM D 75	Sampling Aggregate
ASTM D 422	Test Method for Particle Size Analysis of Soils
ASTM D 516-88	Standard Test Method for Sulfate Ions in Water
ASTM D 693	Crushed Stone, Crushed Slag and Crushed Gravel for Dryer Water-Bound Macadam Base Courses and Bituminous Macadam Base and Surface Courses of Pavements
ASTM D 698	Test Method for Moisture Density Relations of Soils and Soil- Aggregate Mixtures Using 5.5-lb. Hammer and 12-Inch Drop
ASTM D 751	Burst Strength
ASTM D 1556	Test Method for Density of Soil in Place by the Sand-Cone Method
ASTM D 1557	Test Method for Moisture Density Relations of Soils and Soil- Aggregate Mixtures Using 10-lb. Hammer and 18-Inch Drop
ASTM D 1682	Ultraviolet Resistance Grab Tensile Strength Grab Tensile Elongation Toughness
ASTM D 1751	Specification for Preformed Expansion Joint Fillers for Concrete Paving



and Structural Construction

ASTM D 1752	Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction
ASTM D 2167	Test Method for Density of Soil in Place by the Rubber-Balloon Method
ASTM D 2216	Method for Laboratory Determination of Water (Moisture) Content of Soil, Rock and Soil Aggregate Mixtures
ASTM D 2363-78	Trapezoid Tear Strength
ASTM D 2419	Sand Equivalent Value of Soils and Fine Aggregate
ASTM D 2487	Test Method for Classification of Soils for Engineering Purposes
ASTM D 2922	Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Method
ASTM D 3017	Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3665	Random Sampling of Paving Materials
ASTM D 4253	Test Method for Maximum Index Density of Soils Using Vibratory Table
ASTM D 4318	Test Method for Liquid Limit, Plastic Limit and Plasticity Index of Soils
ASTM D 4397	Specification for Polyethylene Sheeting for Construction, Industrial and Agricultural Applications
ASTM D 4546	Test Method for One-Dimensional Swell or Settlement Potential of Cohesive Soils
ASTM E 329	Recommended Practice for Inspection and Testing Agencies for Concrete, Steel and Bituminous Materials as Used in Construction
ASTM F 477	Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F 758	Smooth-Wall Poly (Vinyl Chloride) (PVC) Plastic Underdrain Systems for Highway, Airport and Similar Drainage

D. D.AMERICAN WELDING SOCIETY (AWS), 550 NW LeJeune Road, Miami, FL 33135AWS Code for Welding in Building Construction (Structural Welding Code).

E. CONCRETE REINFORCING STEEL INSTITUTE (CRSI)933 N. Plum Grove Road, Schaumburg, IL 60195, (312) 490-1700

Manual of Standard Practice

F. COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) Division of Administration, Office of Bid Plans, 4201 E. Arkansas Avenue, Denver, CO 80222

Standard Specifications for Road and Bridge Construction (latest edition) Colorado  
Standard Plans, M&S Standards

- G. FEDERAL HIGHWAY ADMINISTRATION (FHWA) Superintendent of Documents, US  
Government Printing Office, Washington DC, 20402

Manual of Uniform Traffic Control Devices (latest edition)

#### **PART 4 - MEASUREMENT**

##### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

#### **PART 5 - PAYMENT**

##### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section.

**END OF SECTION 01 42 25**

## SECTION 01 42 30

### DEFINITIONS AND CONVENTIONS

#### PART 1 - GENERAL

##### 1.01 SUMMARY

- A. This Section contains a list of definitions of words or phrases and grammatical or contextual conventions commonly used in these contract documents.

##### 1.02 REFERENCES

- A. Related Documents: General Conditions, Special Conditions, and applicable provisions of Technical Specifications Division 1 apply to this Section.

##### 1.03 DEFINITIONS

- A. Alphabetical Listing of Definitions
1. **As indicated:** Shown on the drawings by graphic indication, notes or schedules, or written in the specifications or elsewhere in the contract documents.
  2. **As directed, as approved, as requested:** Unless otherwise indicated, these terms imply "by the Project Manager" and require that an instruction be obtained by the Contractor from the Project Manager.
  3. **Concealed:** Embedded in masonry, concrete or other construction; installed in furred spaces; within double partitions or hung ceilings; in trenches; in crawl spaces or in enclosures.
  4. **Ensure:** To make certain in a way that eliminates the possibility of error.
  5. **Exposed:** Not installed underground or "concealed" as defined above.
  6. **Furnish or Provide:** To supply, install and connect complete and ready for safe and regular operation of particular work unless specifically otherwise noted.
  7. **Indicated, Shown, or Noted:** As depicted on drawings or specifications.
  8. **Install:** To erect, mount and connect complete with related accessories.
  9. **Or equal, or approved equal:** Refers to products which, in the opinion of the Project Manager, are similar in all respects to products specified by proprietary brand name. (Refer to Section 01630 for procedures for submittal of proposed substitutions.)
  10. **Rework:** To repair existing items or work required to be removed and replaced in order to accomplish the Work in accordance with the contract documents.
  11. **Related Work:** Includes, but not necessarily limited to, mentioned work associated with, or affected by, the work specified.
  12. Reviewed, Satisfactory, Accepted, or Directed: Assumes by or to the Project Manager.
  13. **Similar, or Equal:** Same in materials, weight, size, design, construction, capacity, performance and efficiency of specified product.
  14. **Supply:** To purchase, procure, acquire and deliver complete with related accessories.

15. **Unless Otherwise Indicated and Unless Otherwise Noted:** General note to perform work as indicated or shown on drawings or in specifications unless specifically directed otherwise elsewhere in the contract documents; may be abbreviated "U.O.N.", "U.O.I.", or "U.N.O.".

**16. BIM Model Definitions**

- a. Building Information Model (BIM): Is a digital representation of the physical and functional characteristics of the Project and is referred as a Model(s) which term may be used to describe a Model Element, a single Model or technology used to create the Model.
- b. Design Model: A Model that has reached the stage of completion that would customarily be expressed by an architect or engineer in two-dimensional Construction Documents.
- c. Construction Model: The equivalent of shop drawing and other information useful to construction. A model that consists of data imported from a "Design Model" or, if none exist, from a designer's "Construction Document".
- d. Federated Model: Distinct component models "linked" together in such a manner that the linked data sources do not lose the intent or integrity by being so linked.
- e. Level of Development: (LoD) describes the level of completeness to which a Model Element is developed.
- f., Model Element: Is a portion of the BIM representing a component system or assembly within a building or building site.
- g. Model Element Author: Is the party responsible for developing the content of a specific Model Element to the LoD for a particular phase of the Project.

**1.04 BIM REFERENCE STANDARDS**

- A. Refer to DIA Design Standard Manual (DSM) Volume 12, and the proposed minimum requirements of DSM Chapter 4.3.2 "BIM Execution Plan for additional BIM" for more detail requirements and regulations for this project. The execution plan shall be further developed jointly with DIA/PMT and the Contractor to specifically address the administrative steps necessary to provide comprehensive BIM system before during and after construction.

**1.05 CONVENTIONS**

- A. Specifications Format
  - 1. In order to standardize the location of information in the Contract Documents, the specifications generally are organized in one or more of the following formats:
    - a. The "MASTERFORMAT" 2011 Edition published by the Construction Specifications Institute.
    - b. The Standard Specifications for Road and Bridge Construction published by CDOT.
    - c. The alpha-numeric system as published by the FAA.
- B. Organization of Drawings and Specifications
  - 1. Organization of the specifications into divisions and sections, and arrangement or numbering of drawings is intended solely for the convenience of the Contractor in his responsibilities to divide the Work among subcontractors or to establish the extent of work to be performed by any trade.

2. Neither the Owner nor the Project Manager assume any liability arising out of jurisdictional issues or claims advanced by trade organizations or other interested parties based on the arrangement or organization of drawings or specifications.

C. Gender and Number

1. For convenience and uniformity, parties to the Contract, including the Owner, Contractor, and Project Manager, and their subcontractors, suppliers, installers, consultants or other interested parties are referred to throughout the contract documents as if masculine in gender and singular in number. Such reference is not intended to limit the meaning of the contract documents to the masculine gender or singular number.

D. Singular vs. Plural

1. Materials, products, equipment or other items of work referred to in the singular shall be construed as plural where applicable by the intent of the contract documents and shall not limit quantities to be provided by the Contractor.

E. Imperative Mood

1. Specifications and notes on the drawings or elsewhere in the contract documents are generally written in the imperative mood as instructions to the Contractor, whether the Contractor is specifically addressed or not.

F. References to Subcontractors or Trades

1. References to subcontractors, trades or other entities which are not parties to the contract shall be construed as meaning the Contractor whose responsibility it shall be to divide the Work among subcontractors or trades. Such references are used as a matter of convention, and are not intended to preclude or direct the Contractor's responsibility to divide the Work.

G. Abbreviations

1. A list of abbreviations used in the contract documents is included in Technical Specifications Section 01070; an abridged list of abbreviations used on the drawings is included with the drawings.
2. Abbreviations are believed to be those in general use in the construction industry. Contact the Project Manager for clarification of abbreviations for which the meaning is not clear.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**PART 4 - MEASUREMENT**

**4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

**5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section.

**END OF SECTION 01 42 30**

## SECTION 01 45 10

### CONTRACTOR QUALITY CONTROL

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. This Section identifies the Quality Control activities to be performed during all phases of the contract by the Contractor.
- B. The Contractor shall have in place his/her Quality Control Program as necessary to ensure that all materials and work are completed in compliance with contract documents. The Contractor is solely responsible for Quality Control and shall provide the necessary quality control personnel to assure that all materials, workmanship, and tests are in conformance with the project documents with the exception of those tests and/or audits that may be conducted by the City as defined in the contract documents.
- C. Test schedules and/or testing requirements for materials used on this project are included in the technical specifications. Laboratory and field testing identified in the technical specifications shall be conducted by an Independent Testing Agency (ITA) retained by the Contractor.
- D. The owner or the consultant working as the owner representative will employ a special Inspector to perform all required inspections and tests required by the Special Inspection Statement as approved by the Building Official and any tests required by the Building Official to fulfill the code and the regulatory authority's requirements. The agency qualifications and requirements are defined in section 01 45 45.

##### 1.02 SUBMITTALS

- A. Refer to Technical Specification Section 01 33 00 and Technical Specifications Section 01 33 25, for submittal requirements.
- B. Quality Control Plan: Within 10 days after Notice to Proceed, the Contractor shall submit a Quality Control Plan for review and acceptance. The Quality Control Plan shall be accepted by the PMT/DIA Project Manager prior to any work or materials being incorporated into the project. Acceptance by the DIA Project Manager does not relieve the Contractor of its responsibility to comply with the Contract Requirements. The Contractor Quality Control Plan shall address the following as a minimum:
  - 1. A general description of Quality Control monitoring to be performed until final acceptance by DIA. Include monitoring activities of Work and the worksite during times that no construction activity is scheduled to take place.
  - 2. An individual designated by the Contractor whose sole responsibility is Quality Control Management. This individual shall be highly qualified in all phases of construction as it relates to this project and shall have the authority to direct work changes required to bring the Work into conformance with contract requirements, including stopping non-conforming work in progress. A resume of the proposed Quality Control Manager including applicable education, experience and certifications shall be included in the Quality Control Plan.
  - 3. At the discretion of the DIA Project Manager for, Small Projects, Early Work Packages

and Task Orders all of value less than \$1,000,000 or a duration which is less than 3 months. The Contractor may assign one of the Contractor's staff, i.e. Contractor's Superintendent, Office Engineer, Field Engineer, or Project Manager as Quality Control Manager. The assigned person must be available on site to discuss quality issues and manage all aspects of the Project Quality Control Plan and coordinate all required Special Inspection and Quality Assurance testing and provide proposed solutions on all quality issues at any time as to not cause any delay to the project. Any delays caused in part or in all due to defective or no conforming work shall be borne by the Contractor.

4. Quality Control inspection staff as needed to assist the Quality Control Manager with implementation of the Quality Control Program. Duties of the Quality Control Inspectors shall be limited strictly to inspection of the ongoing work. Sampling and testing of materials shall be performed by Quality Control personnel other than Quality Control Inspectors. Quality Control Inspectors shall inspect only those work elements for which they are qualified. Resumes of the proposed Quality Control Inspectors including applicable education, experience and certifications shall be included in the Quality Control Plan.
5. An Organization Chart identifying all Quality Control staff by name and function. The chart shall indicate the total staff required to implement all elements of the Quality Control Program, including inspection and testing for each item of work including tests performed by the special inspection or the independent testing agency or the owner testing Agency. If necessary, different Quality Control staff can be utilized for specific inspection and testing functions for different items of work. The chart shall show that the Quality Control Manager, Quality Control Inspectors, and Quality Control testing personnel are outside of the production staff with clear lines of authority for Quality Control.
6. For the South Terminal Redevelopment Program; The Owner and/or the Owner Program Management Team acting as the owner agent will employ a testing and /or special inspection agency. The Contractor's testing and inspection shall be performed for the processing, preparation and to request owner's inspection and as necessary to produce the required product as specified in the Contract Documents. While the test frequency performed by the Contractor is not required to meet a minimum frequency. It should be noted that the Owner or its Agent could mandate a testing frequency for those activities that are not meeting a repetitive success rate of 97%. Tests performed by the owner agent cannot be used for process control of the Contractor's work or as a subcontractor work acceptance by the prime contractor.
7. Any test performed by any agency on the project shall be recorded and show a passing re-inspection of all failing tests.
8. Any tests submitted by the contractor for basis of acceptance, or payment reduction When performed by the Contractor's agency must meet all standards and must be certified to have followed approved procedure, processed in a certified lab by properly certified or licensed personnel by properly certified testers and on calibrated and certified equipment. Authentications of tests must be preapproved and cannot be selectively submitted. All tests shall be recorded in the field witnessed by DIA/PMT inspector to be accepted as a record test of the material in question. Any failing tests could be the sole basis for rejecting the material.
9. Each technical specification division's requirements for quality control identifying each item requiring submittal and approval/acceptance prior to installation of work, all inspections to be performed during work and prior to acceptance of work, each item of work requiring testing by the independent testing agency or the owner provided testing agency, and the testing frequency.



10. The plan shall address all elements of special inspection required by the statement of special inspection as approved by The Building official. All special inspections and tests will be performed by an agency(s) employed directly by the owner or a consultant acting as an owner agent as defined by Chapter 17 of the IBC.
11. The Contractor is responsible for the complete record of inspection file including but not limited to all manufacturer certificates, certificates of material compliance, Certificates of Material Testing Record, successful re-inspection of all deficiency items, proper deposition of design related NCR's and CAR's, Structural Engineers' observation reports, certification letters from the Special Inspection Agency(s), Building Inspectors' records of approvals, Permit cards, Fire suppression and fire- alarm tests records as witnessed by the authorities of jurisdiction and any record necessary to achieve a certificate of occupancy. related testing record, to be submitted to the
12. Establish controls and documentation format to ensure that items or materials that have been accepted through receiving inspection are used or installed. Identification and traceability shall be provided throughout all inspections, test activities and records. For stored items, provisions shall be made for the control of item/material identification, consistent with the expected duration and type of storage.
13. A methodology of monitoring, testing and exercising of all equipment, valves and/or assemblies to ensure the Work installed is in proper working order.
14. A list of suppliers and subcontractors. This list shall include items to be supplied by each supplier and/or subcontractor and shall identify work to be performed by each subcontractor. The list shall be updated and resubmitted as required.
15. Manufacturer's quality control plans and any certification to allow the fabrication of the material without special inspection and testing in accordance with section 1704.2.2 of the IBC.
16. All approvals related to Special Inspection are subject to the acceptance or approval of the Building Official as regulated by sections 105, 106, 109 and Chapter 17 of the Building code as amended by CCD.
17. Emergency contact information including name, company, title, work phone number, home phone number and other means of contact. The Emergency Contact list shall include at least four individuals. The Emergency Contact list shall be maintained on a daily basis. In the event there is any change in any of the information, the Contractor shall forward the updated list to the Project Manager and to DIA Maintenance Control (303-342-2800). The Emergency Contact list shall include the project number, project title and date of issue.

C. Contractor's Daily Foreman Report:

1. A Contractor's Daily Foreman report shall be completed on form included in Technical Specifications Section 01 99 90. The Foreman may add sheets of information to this form as needed. The report shall address as a minimum the following: daily activities, quantities of material placed and completed, weather, safety issues, personnel by trade, equipment on site with time used, equipment under repair, work delays, possible delays, and materials delivered.
2. The Contractor's Daily Foreman Reports reporting shall be computerized or typed and may contain an electronic signature. Reports shall be transmitted to the DIA Project Manager electronically on the following work day.

D. Contractor's Daily Quality Control Inspection Report:

1. Contractor's Daily Quality Control Inspection Reports shall be completed on the form included in Technical Specifications Section 01999. The reports shall be written by the Quality Control Manager and all Inspectors. The Quality Control Manager and Inspectors may add sheets of information to this form as required. The report shall address as a minimum the following: the work requiring inspection identified by the technical item number and description, results of the inspections, material compliance with approved submittals, proper storage of materials and equipment, adherence to plans and technical specifications, review and description of quality control tests, compliance of testing frequencies, location and nature of defects or deviations found, causes for rejection, and corrections required to bring the Work into conformance with the contract.
  2. Contractor's Daily Quality Control Inspection Reports shall be computerized or typed and may contain an electronic signature of the author. Reports shall be transmitted to the DIA Project Manager electronically on the following work day.
- E. For Small Projects, EWP on CM/GC Contracts, Task Orders all for a base bid contract value of less than \$1,000,000 and/or a duration of three months or less a report with both daily and quality information may be combined at the discretion of the Project Manager.
- F. Corrective Action Report (CAR)
1. Conditions adverse to quality will be reviewed by the Contractor to determine the cause and to recommend a corrective action that will preclude recurrence. The condition, its cause and the corrective action planned shall be reported to the Project Manager prior to implementation. Follow-up action shall be taken to verify implementation of the corrective action. The Contractor will document the corrective action and a copy of the Corrective Action Report (CAR) will be transmitted to the DIA/PMT Project Manager. For any deficiency that deals with a special inspection issue or propose any alteration to the original design must be addressed in a CAR issued by the Contractor or an NCR issued by the owner and must be reviewed by the Engineer of Record for approval and must be re-inspected by the Special Inspector or the DIA/PMT inspector for approval and closure.

### 1.03 DOCUMENTATION

- A. The Contractor shall not change or alter approved submittals, procedures, specifications, drawings or other pertinent documentation without the Project Manager's written authorization.
- B. All records and documents that are quality related shall be prepared, identified and maintained by the Contractor and shall be made available to DIA upon request. Records shall be protected from damage, deterioration or loss. A copy of the records and documents shall be maintained at the Work site at all times unless the Project Manager has approved other locations in writing. Retention time for all quality records shall be not less than three years from date of Final Acceptance of the contract.
- C. The Contractor is responsible for the complete record of inspection file including but not limited to all manufacturer certificates, certificates of material compliance, Certificates of Material Testing Record, successful re-inspection of all deficiency items, proper deposition of design related NCR's and CAR's, Structural Engineers' observation reports, certification letters from the Special Inspection Agency(s), Building Inspectors' records of approvals, Permit cards, Fire suppression and fire- alarm tests records as witnessed by the authorities of jurisdiction and any record necessary to achieve a certificate of occupancy. related testing record,

- D. The Contractor shall maintain records at the actual worksite and at Contractor's office to show the inspection status of materials and items installed in order to ensure that the required inspections and tests have been performed in a timely and correct manner.
- E. The Contractor must keep a record of all deficiency issues and show positive evidence of closure (passing re-inspection or re-test) to every issue.

#### 1.04 INSPECTIONS AND TESTS

- A. Inspections, tests and system shut down requests, conducted by persons or agencies other than the Contractor, shall not in any way relieve the Contractor of his responsibility and obligation to meet all specifications and the referenced standards. The Contractor's designated Quality Control Representative shall inspect the work and shall ensure the work complies with the contract requirements prior to any requests for inspection or testing.
- B. When the specifications, laws, ordinances, rules, regulations or orders of any public agency having jurisdiction require the Project Manager's surveillance of inspections or tests, the Contractor shall notify the Project Manager of the place, date and time 48 hours prior to the inspection and/or test. The Contractor shall be responsible for notifying and requesting inspection by other agencies including but not limited to the Denver Building Inspection Division, Denver Fire Department and Denver Water Department. Prior to request for other agency inspections, the Contractor shall meet and plan inspection times with the Project Manager and or the Project Manager's designated representative.
- C. Special inspections or tests may be required by the technical specifications, City, State and/or Federal Agencies in addition to those tests already performed. The Contractor shall notify the Project Manager at least 48 hours in advance of the additional inspections or tests.
- D. Quantities will be verified as defined in the Pre-Work Meetings.

#### 1.05 INSPECTION PLAN

- A. The Contractor shall utilize the following six-point inspection plan to ensure the conformance of the Work performed by the Contractor meets the requirements of the contract drawings and specifications, the referenced codes and standards and the approved submittals:
  - 1. **Prework Coordination:** Prior to the start of construction work on the contract and prior to the start of work under each separate specification section and prior to the start of work where a change in a construction operation is contemplated by the Contractor and prior to a new subcontractor starting work, a coordination meeting will be held with the Contractor's superintendent, Quality Control and Safety representative(s), the ITA representative, the DIA Project Manager and DIA inspectors. Supervisory, Safety and Quality Control, representatives of all applicable subcontractors will also attend. Prior to the meeting, the Contractor's Quality Control Manager shall provide the DIA Project Manager with a meeting agenda for review. The Contractor's Quality Control Manager shall conduct the meeting and distribute the approved agenda. The Quality Control Manager shall develop and electronically distribute finalized meeting minutes within 24 hours upon completion of the meeting.

The purpose of the meeting is to ensure that the Contractor's personnel have no misunderstandings regarding their safety and quality procedures as well as the technical requirements of the contract. The following items shall be presented and reviewed by the Contractor:

    - a. Contract requirements and specifications

- b. Shop drawings, certifications, submittals and as-built drawings
  - c. Testing and inspection program and procedures
  - d. Contractor's Quality Control program
  - e. Familiarity and proficiency of the Contractor's and subcontractor's workforce to perform the operation to required workmanship standards including certifications of installers
  - f. Safety, security and environmental precautions to be observed
  - g. Any other preparatory steps dependent upon the particular operation
  - h. The Contractor's means and methods for performing the Work.
2. Initial Inspection: Upon completion of a representative sample of a given feature of the Work and no later than two weeks after the start of a new or changed operation, the Project Manager and/or the Project Manager's designated representatives will meet with the Contractor's Quality Control representative and applicable subcontractor's supervisor and their Quality Control representatives to check the following items, as a minimum:
- a. Workmanship to established quality standards
  - b. Conformance to contract drawings, specifications and the accepted shop drawings
  - c. Adequacy of materials and articles utilized
  - d. Results of inspection and testing methods
  - e. Adequacy of as-built drawings maintained daily.

Once accepted, the representative sample will become the physical baseline by which ongoing work is compared for quality and acceptability. To the maximum practical extent, approved representative samples of work elements shall remain visible until all work in the appropriate category is complete. Acceptance of a sample does not waive or alter any contract requirements or show acceptance of any deviation from the contract not approved in writing by the Project Manager.

3. Follow-up Inspection: The Contractor's Quality Control representative will monitor the work to review the continuing conformance of the work to the workmanship standards established during the preparatory and initial inspections.
4. Completion Inspection: Forty-eight hours prior to the completion of an item or segment of work and prior to covering up any work, the Contractor will notify the Project Manager who will verify that the segment of work is substantially complete, all inspections and tests have been completed and the results are acceptable. The purpose of this inspection is to allow further corrective work upon, or integral to, the completed segment of work. THIS IS NOT AN ACCEPTANCE INSPECTION. If any items are determined to be deficient, need correction or are non-conforming, a Deficiency List will be prepared and issued to the respective Contractor for correction, repair or replacement of any deficient or non-conforming items. The Project Manager and Contractor's Quality Control representative will verify the correction of the deficient and/or non-conforming items prior to the start of the next operation.
5. Pre-Final Acceptance Inspection: Prior to requesting a Pre-Final Acceptance Inspection by DIA, all work and operational systems to be inspected shall be satisfactorily completed and tested by the Contractor. The Contractor's written request for this inspection shall be made 72 hours in advance. With the request shall come a list of any known deficiencies and when they will be corrected. If the list is too large or contains too many significant items, in the opinion of the Project Manager, no inspection will be held because of the incompleteness of the work.

The Project Manager will schedule the Pre-Final Acceptance Inspection and will prepare

a list of deficient items (punch list) discovered during the inspection. If during the inspection the list becomes too large or too many significant items are on the list, the inspection will be canceled. After the inspection is completed, the Deficiency List will be transmitted to the Contractor for correction of the deficient items.

6. Final Acceptance Inspection: After the Contractor has completed all items on the Deficiency List (generated from the Pre-Final Acceptance Inspection) he shall request a Final Acceptance Inspection. The request shall be made in writing at least 72 hours in advance of the inspection. All areas must be cleaned and ready for turnover prior to this inspection. The Project Manager, the design consultant, a representative of the funding agency (if applicable) and other interested parties will inspect the subject Work to ensure that all deficiencies have been satisfactorily attended to and that no new deficiencies have appeared and that all systems are completely functional. Any outstanding or additional deficient items will be noted and handled per the requirements of the Pre-Final Acceptance Inspection noted above until the Work is acceptable to the Project Manager.

## 1.06 SAMPLES

- A. The Contractor shall maintain at the worksite a copy of all samples submitted and accepted by DIA/PMT. Samples shall be made available to the designer or the Project Manager's designated representatives for review and comparison in the field. The Project Manager prior to use on the project must accept all items and materials.
- B. The installed work will be compared to the samples and if any of the work is not of the same quality, material, finish, color, texture or appearance as the sample, that portion that is not the same will be considered defective and in nonconformance.
- C. Contractor selection of samples will only be considered if taken at random. The Contractor shall permit representatives of DIA/PMT to witness the selection of samples. Inspection or tests of items or materials that fail shall be sufficient cause to terminate further inspections/tests of the same brand, make or source of that product.
- D. The Contractor is obligated to correct any item deemed deficient.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.01 REQUIREMENTS

- A. All materials required for the contract shall be new except where specified otherwise. The Project Manager may elect to perform additional inspections and/or tests at the place of the manufacture, the shipping point or at the destination to verify conformance to applicable specifications. Inspections and tests performed by DIA shall not relieve the Contractor from the responsibility to meet the specifications, nor shall such inspections/tests be considered a guarantee for acceptance of materials that will be delivered at a later time.
- B. The Contractor is obligated to correct or remove non-conforming materials, whether in place or not. If necessary, the Project Manager will send written notification to the Contractor to correct or remove the defective materials from the project. If the Contractor fails to respond, the Project Manager may order correction, removal and/or replacement of defective materials by others, in which case the Contractor shall bear all costs incurred by such actions.
- C. Materials accepted on the basis of a Certificate of Compliance may be sampled and

inspected/tested by DIA/PMT or its designer at any time. The fact that the materials were accepted on the basis of such certification shall not relieve the Contractor of his responsibility to use materials that conform to the specifications.

- D. The Contractor shall impose upon his suppliers the same quality control requirements, including inspection and test procedures, as imposed upon him by the specifications and referenced standards. The Contractor shall apply appropriate controls, designed to ensure that all materials supplied meet the requirements and specifications.

#### **PART 4 - MEASUREMENT**

##### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

#### **PART 5 - PAYMENT**

##### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable multiplier for the division under which the work falls. If the City is required to re-inspect work or conduct a special test because a previous inspection, requested by the Contractor, showed that the work was defective or not in conformance, the Deputy Manager/ Program Manager or his authorized representative may deduct from the contract value the cost of re-inspection at the rate of \$100.00 per man-hour.

**END OF SECTION 01 45 10**

## SECTION 01 45 45

### SPECIAL INSPECTION AGENCY AND OWNER TESTING AGENCY(S)

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

The Owner will employ the services of Special Inspection Agency(s) (SIA). This Section identifies the requirements for the Contractor to coordinate, facilitate and support the owner and its agents and consultants to fulfill the requirements of Special Inspection requirements as identified in the IBC 2009 as amended by Denver 2011.

- A. Any additional tests deemed necessary by the Building Official, Engineer of Record, Special Inspector or DIA Project Manager to assure these agencies that all material and work on the project meet the requirements of the Contract and all applicable codes and regulations.
- B. Minimum Laboratory and field testing requirements to be conducted by the SIA for materials and construction on this project are included in table 014545-1 of this section.
- C. All caissons and piers drilling on this project shall be continuously inspected by Special Inspection Agency hired by the Owner directly.
- D. The Contractor shall not perform any work which could cover work or material that has not passed the requirement of special inspection or require the presence of the special inspector to meet the requirements of continuous or periodic inspection.
- E. It is the responsibility of the Contractor to plan, coordinate all testing requirements on the project to assure no delays are occurring due to the lack of inspection or testing.
- F. The Contractor must allow sufficient time in the schedule to perform all required inspection and testing.
- G. All rework due to nonconformance, failing tests or rework to test covered work prior to proper inspection and testing shall be borne by the Contractor.
- H. All re-inspections and re-testing costs due to non-conformances or failing tests or revisiting to test covered or incomplete work shall be borne by the Contractor at a cost of \$100 per hour in addition to all direct and indirect costs associated with testing.
- I. Periodic welding inspection shall include the minimum of fitting inspection and final inspection at all times.
- J. Inspections and tests conducted by the SIA shall not in any way relieve the Contractor of his responsibility and obligation to meet all specifications and referenced standards. Employment of the SIA does not relieve the Contractor of providing the required Quality Control program.
- K. When inspections or tests by the SIA prove that the item or material does not meet all applicable specifications and requirements, the cost incurred for the re-testing or re-inspection shall be borne by the Contractor (see paragraph 5.01 of this Technical Specifications Section).

- L. Samples will only be considered if taken at random. The Contractor shall permit representatives of the City to witness the selection of samples. Inspection or tests of items or materials that fail shall be sufficient cause to terminate further inspections/tests of the same brand, make or source of that product.
- M. The Contractor is obligated to correct any item deemed deficient at no additional cost to DIA.

## 1.02 RELATED DOCUMENTS

- A. International Building Code 2009 amended by Denver 2011.
- B. Special Inspection Statement issued as part of the application for building permit for the specific task or project.

## 1.03 SUBMITTALS

- A. All submittals shall comply with requirements of Technical Specifications Sections 01300 and 01340 for submittal requirements.

## 1.04 CONTRACTOR SUBMITTAL OF PROPOSED CONTRATOR'S TESTING AGENCIES

- A. The Contractor shall employ the services of a Testing Agency for process control and acceptance by the subcontractors and suppliers or material delivery for Contractor convenience or contractual obligations with others. The Contractor's Testing Agency must be accredited agency to perform any test required to be submitted for compliance with a contract requirement or for use of data by the owner agency's for any official use, for examples and not to grant any obligation on the Project Management Team, any payment reduction factor calculation. Any dispute or requirement to recalibrate testing equipment or machine, proof of compliance of material that was installed in contrary to manufacturer recommendation, any apparent defect due to (adverse weather, improper installation, incomplete material record.

Contractor's testing agency must be a qualified entity(s) that has performed testing on similar jobs in size and complexity and has been accredited by AASHTO or CCRL or an approved equal to perform the test(s) required in the contract. The CTA may also provide technicians to perform the required inspections. However, inspection and testing cannot be performed simultaneously by the same technician.

- B. The Contractor shall not submit for acceptance to the DIA Project Manager any testing agency or laboratory utilized in the design or construction document preparation or presently employed by DIA as part of DIA Quality Assurance.
- C. For consideration of acceptance, the Contractor shall submit to the DIA Project Manager the following items received from the CTA:
  - 1. Affidavit of current accreditation from a national certification and/or accreditation program.
  - 2. Evidence that the CTA Laboratory is accredited to perform the testing required in the Technical Specifications.
  - 3. Resumes and evidence of professional engineer registration and licensing in the State of Colorado for the personnel reviewing and signing test reports.
  - 4. Resumes and current certifications verifying that SIA management and supervisory personnel, laboratory staff, field testing technicians, and inspecting technicians are



qualified in accordance with ASTM C 1077, D 3666, D 3740, and E 329 requirements to perform the work. NICET, ACI, WAQTC, LabCAT, CDOT, NRMCA, PCA, AWS, ASNT certifications or a degree in a related engineering field with construction field experience can demonstrate qualifications. A list summarizing all management, supervisory, laboratory, field testing, and inspection personnel assigned to the project including the testing and/or inspection each individual will be performing, certifications held by each individual, and the expiration date of each certification.

5. A matrix indicating each technical specification section, paragraph, quantity and type of sampling and/or testing required.
6. Copies of all laboratory, field testing, and inspection report forms.

#### 1.05 SUBMITTAL OF REPORTS

- A. Test results shall be submitted by the Special Inspector and/or Owner Testing Agency to the DIA/PMT Project Manager after completion of inspections/tests by the SIA/OTA and prior to incorporation of the item(s) into the Work unless the test or inspection must be done during or after installation.

All field test results including but not limited to fresh concrete properties and in-place moisture-density shall be reported in legible draft form to the DIA/PMT Inspection and the Contractor Quality Control Manager immediately at the test site. Any failing test shall be reported separately to the DIA/PMT Inspector or DIA/PMT Project Manager within 2 hours after the discovery. The draft test results shall also be attached to the Daily Quality Control Inspection Report (reference Technical Specifications Section 014510, paragraph 1.02.D) and transmitted to the DIA/PMT Project Manager on the next work day.

- B. The Contractor's Quality Control Manager or his/her Authorized representative must keep track and official record of all tests passed, failed or defected. The Contractor shall be fully responsible to show passing tests of all required elements. The lack of any passing test record of any required element does not waive the requirement to of testing or inspection as required by the Contract Documents and the IBC code. The Contractor shall bear all costs associated with recovering missing tests including but not limited to the cost of the cost of disassembling, testing or inspecting, reassembling, and any indirect time or cost impacts of a missing required test or inspection.
- C. Typed test reports shall be provided by the testing agency to the DIA/PMT Project Manager as specified in paragraph 1.06 Weekly Reports. The test reports shall be numbered sequentially in chronological order. Individual tests shall be numbered sequentially. The reports and tests shall also be organized per specification section. All test results must be reviewed and signed by a registered licensed engineer in the State of Colorado. The signature represents that the test procedures used are in strict conformance with the applicable testing standard, the calculated data are true and accurate, the tools and equipment used were in calibration, the sample was not contaminated and the persons running the test were qualified.
- D. A plan of work and administrative procedure shall be established to assure that all test and inspections frequency required are performed and all defects are tracked and retested and re-inspected to meet all applicable specs, codes, and standards.
- E. The Contractor shall track all tests performed on the daily reports and shall submit a statement for each phase of the work showing all elements of Quality have been completed and all defects are addressed or scheduled to be addressed prior to covering the work.

- F. Reports of inspections and test activities are record documents and shall be maintained in a manner that provides integrity of item identification, acceptability and traceability. Reports shall identify the following:
1. Contractor's name
  2. DIA Contract number and title
  3. Testing Agency name
  4. Name of item(s) inspected/tested including a physical description and, as applicable, model and make
  5. Quantity of items
  6. Inspection/test procedure used. If national standards are used, any deviation from these standards
  7. Date the sample was taken and the date the test was made
  8. Location (by coordinates, building grid or station number) of where tests and/or samplings were performed including environmental condition where applicable. Include plan drawing indicating location of test and work item sampled or tested
  9. Name of inspector/tester
  10. In the event the testing or sampling is a re-test or re-sampling, reference the previous respective testing or sampling report
  11. Specified requirements in the contract that the item must meet. Include reference to technical specification section and paragraphs
  12. Acceptability
  13. Deviations/nonconformance
  14. Corrective action
  15. Evaluation of results
  16. All information required for the specific test as specified in the applicable ASTM standard
  17. Signature of authorized evaluator.

#### 1.06 WEEKLY SUMMARY REPORTS

- A. The SI/OTA shall prepare and submit to the DIA/PMT Project Manager a weekly summary report each week which summarizes by specification section all work activities and results for the quality control tests and inspections conducted during that period. The weekly summary report shall be submitted within two (2) weeks from the end of the reporting period. At a minimum, the weekly summary report shall identify all inspections, test types, test locations, testers, test results, specifications, whether the test passed or failed, quantity of materials placed and the number of tests performed for each material, and the material supplier, installer and Contractor. Re-tests shall be identified in a fashion that easily correlates to the failing test. Any failed tests that have not been corrected when the report is published shall be highlighted and noted in the cover letter of the report. The ITA shall identify costs of re-testing or additional site visits required due to scheduling changes by the Contractor. A current Corrective Action Report log (CAR) shall also be included in the weekly summary report.
- B. The weekly report shall be submitted per Technical Specifications Sections 013300 and 013325 requirements.

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION**

### **3.01 REMOVAL OF NONCONFORMING MATERIAL**

- A. The Contractor is obligated to correct or remove nonconforming materials, whether in place or not. If necessary, the DIA/PMT Project Manager will send written notification to the Contractor to correct or remove the defective materials from the project. If the Contractor fails to respond, the DIA Project Manager may order correction, removal and/or replacement of defective materials by others, in which case the Contractor shall bear all costs incurred by such actions.

### **3.02 PERFORMANCE**

- A. If the DIA/PMT Project Manager determines that the SIA or its personnel are not effectively enforcing or performing the testing and documentation requirements specified in the contract, the DIA Project Manager will, in writing, require the Contractor to remove and replace SIA or such personnel at no cost to DIA.

### **3.03 CONTROL OF MEASURING AND TEST EQUIPMENT**

- A. The SIA shall select measuring and test equipment in such a manner as to provide proper type, range, accuracy, calibration and tolerance for determining compliance with specified requirements. Measuring and test devices shall be calibrated, adjusted and maintained at prescribed intervals prior to use based upon equipment stability and other conditions affecting measurement. Provisions shall be made for the proper handling and storage of equipment. Calibration shall be accomplished using certified standards that have a known traceable relationship to the National Institute of Standards and Technology. Every calibrated measuring and test device shall show the current status, date of last calibration and the due date for the next calibration. Calibration records shall be maintained onsite as quality records and shall be made available for inspection upon the Project Manager's request.

## **PART 4 - METHOD OF MEASUREMENT**

### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under the Section. DIA/PMT staff will track all costs and remark the conditions and track all associated impacts for credits to the City. The contractor record of the same is only valid if signed by the DIA/PMT project manager or authorized representative.

## **PART 5 - PAYMENT**

### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item. If the City is required to re-inspect work because the previous inspection showed that the work was defective or not in conformance, the Director of Construction or his authorized representative may deduct from the contract value the cost of re-inspection at the rate of \$100.00 per man-hour. For tests required by the Contractor for its own use, processing control, additional tests not required by the specs, code or regulation the City through its owner's agent may deduct from the contract value the cost of re-inspection at the rate of \$100.00 per man hour and any additional charges associated with the additional inspection or

testing.

## SECTION 01 50 50

### MOBILIZATION

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. The Work specified in this Section consists of preparatory work and operations including, but not limited to, those necessary for the movement of personnel, equipment, supplies and incidentals to the worksite; for the establishment of all offices, buildings and other facilities necessary for work on the project; and for all other work and operations which must be performed or costs incurred prior to beginning work on the various contract items on the worksite.

##### 1.02 SUBMITTALS

- A. Refer to Technical Specifications Sections 01 33 00 and 01 33 25 for submittal procedures.
- B. Submit a Mobilization Schedule 15 days prior to first billing for mobilization.

##### 1.03 DELIVERY

- A. Delivery to the worksite of construction tools, equipment, materials and supplies shall be accomplished in conformance with local governing regulations.

#### PART 2 - PRODUCTS

##### 2.01 PRODUCTS

- A. Provide construction tools, equipment, materials and supplies of the type and quantities that will facilitate the timely execution of the Work.

#### PART 3 - EXECUTION

##### 3.01 EXECUTION AND REMOVAL

- A. Provide personnel, products, construction materials, equipment, tools and supplies at the worksite at the time they are scheduled to be installed or utilized.
- B. Upon completion of the Work, remove construction tools, apparatus, equipment, unused materials and supplies, plant, and personnel from the jobsite.

#### PART 4 - MEASUREMENT

##### 4.01 METHOD OF MEASUREMENT

- A. The Contractor shall submit for the Project Manager's approval 15 days prior to the first mobilization billing a detailed breakdown of all items, including subcontractor mobilization items that are proposed to be invoiced under Mobilization as part of the Schedule of Values (reference Technical Specifications Section 01 29 10). This breakdown shall be labeled MOBILIZATION SCHEDULE. This schedule will be reviewed by the Project Manager to inform the Contractor what exact types of costs will be approved and paid under Mobilization.
- B. All requests for payment for mobilization shall include a detailed Mobilization Schedule which

shall identify the nature of each expense item, its delivery date, setup and startup date and the actual invoice amounts inclusive of acquisition, taxes, transportation assembly, and installation less all discounts.

- C. The Contractor shall identify a line item in the Mobilization Schedule as "Demobilization" and shall establish the value for this line item, at a minimum, of fifteen percent (15%) of the pay item for mobilization.
- D. The initial approved Mobilization Schedule shall determine the basis for all future mobilization payments.

## **PART 5 - PAYMENT**

### **5.01 MOBILIZATION**

- A. Payment will be made only for substantiated Mobilization costs in accordance with the approved Mobilization Schedule, and only to the limit of the contract lump sum amount for the pay item Mobilization. In no case will the City pay Mobilization in excess of five percent (5%) of the total Contract amount.
- B. Payment for the Contractor's bonds may be included in the Mobilization Schedule to the limits of the actual amount.
- C. Payment amounts for personnel involved in mobilization and listed on the approved Mobilization Schedule shall be limited to the Contractor's certified payroll amounts.
- D. Payment amounts for materials, supplies and transportation involved in mobilization and listed on the approved Mobilization Schedule shall be for the actual amounts paid as shown on invoices marked paid. No payment will be made under mobilization for the cost of permanent materials to be installed for this contract. Payment for permanent material shall be paid in accordance with section 01 29 10
- E. . No payment under mobilization will be made for rented or leased equipment other than actual transportation cost.
- F. No separate payment will be made as part of the Mobilization Schedule for the maintenance and/or use of personnel, equipment, supplies and incidentals after project setup except for demobilization. These costs are to be incorporated in the remaining items of work in the Schedule of Values by multiplier or work request.
- G. For any mobilization payment amounts requested by the Contractor that are unsubstantiated or exceed the allowable limit of five percent of the total Contract amount, the Project City, may in its sole discretion reallocate any, all, or none of those amounts to other work items in the Schedule of Values for lump sum contracts or to be disbursed on a prorated basis as determined by the Project Manager for unit price contracts. Any unsubstantiated mobilization payment amounts not reallocated by the Project Manager will not be paid

**END OF SECTION 01 50 50**

## SECTION 01 52 10

### TEMPORARY FACILITIES

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. The Work specified in this Section consists of furnishing, installing, operating, maintaining and removing temporary construction barriers, enclosures and field facilities including the Contractor's construction offices, staging areas, yards, storage areas, electrical power, telephone, water, fire protection and sanitary service. A construction office is at the Contractor's option.
- B. Construction Offices, Construction Yards and Storage Areas
1. The Contractor's offices, construction yards laydown and storage areas shall be located as shown on the contract drawings and/or as designated by the Project Manager. All construction offices, staging areas and material storage areas are to occur within these areas.
  2. Any activity that is expected to result in disturbance of the ground surface equal to or greater than one acre or part of a larger project that is expected to disturb equal to or greater than one acre, is required to be identified in the Construction Activities Stormwater Management Plan (CASMP) and/or Stormwater Management Plan (SWMP). These areas include, but are not limited to, laydowns, borrow areas, stockpiles, and storage areas regardless of the location.
  3. All areas of ground disturbance are required to be stabilized in accordance with State, local, and airport rules and regulations prior to permit termination and/or closure of the contract.
  4. The Contractor shall restore any area on DIA property that becomes contaminated as a result of its operations in accordance with Airport Rule and Regulation 180. Restoration shall be either to applicable standards under Federal and State law or to such other levels as may be required by the Manager of Aviation, at the Manager's sole discretion.
  5. All temporary facility sites must be inspected prior to contract closeout. The DIA Project Manager or authorized representative shall conduct an inspection of contractor areas used during the life of the project. These areas include but are not limited to, staging areas, laydown areas, borrow areas, and contractor yards and offices. The DIA PM will ensure these areas have been properly stabilized in accordance with DIA Rules and Regulations and restored to the condition in which the City initially provided to the Contractor. A representative from DIA Environmental Services shall be present during the final walk through.
  6. Contractor materials shall be managed in accordance with applicable Environmental Regulations.
  7. Temporary facilities which the Contractor desires to locate in secondary laydown and staging areas adjacent to the Work or within the project limits are subject to approval by the Project Manager. If approved, these areas must also be included in the CASMP and/or SWMP.
  8. Access to and security of the Contractor's construction offices, yard, temporary facilities and storage areas shall be as shown on the Contract Drawings or as specified in the

contract Special Conditions.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION**

**3.01 SIGNAGE**

- A. Contractor shall not provide any signage for temporary facilities without prior approval from the DIA Project Manager.

**PART 4 - MEASUREMENT**

**4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

**5.01 METHOD OF PAYMENT**

No separate payment will be made for work under this section.

END OF SECTION 01 52 10



## SECTION 01 55 25

### TRAFFIC CONTROL

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. The Work specified in this Section consists of furnishing plans and designs for traffic control and haul routes, implementing these plans with all necessary personnel and equipment. Installation may require but not be limited to signage, cones, flaggers, signal lights, lighting and temporary roads. All work must be in conformance with the Manual of Uniform Traffic Control Devices (MUTCD), Colorado Department of Highway Standards and. The Contractor must coordinate his proposed traffic control needs with the needs of other contractors on the airport construction site in writing through the Project Manager.
- B. Reference Contract General Condition, GC 805.

##### 1.02 QUALITY CONTROL

- A. Temporary signal work shall conform to "Standard Specifications for Public Works Construction".
- B. Designate a qualified person to inspect and test traffic control devices daily and to ascertain that those devices are continuously operating, serviceable, in place and clean.
- C. Provide trained personnel who will be responsible for design, implementation and inspection of traffic control needs.

##### 1.03 SUBMITTALS

- A. Refer to Technical Specifications Sections 01 33 00 and 01 33 25 for submittal procedures.
- B. Submit a Traffic Control Plan (TCP) that includes, at a minimum, the following list of items for approval before starting work. Submit an updated TCP when necessary to modify traffic operation or undertake a construction activity that creates a different traffic pattern.
  - 1. Traffic blockade and reductions anticipated to be caused by construction operations.
  - 2. Temporary detours.
  - 3. Show and describe proposed location, dates, hours and duration of detours, vehicular traffic routing and management, traffic control devices for implementing detours and details of barricades.
- C. Submit Haul Route Plan for both on- and off-site hauls. The Haul Route Plan shall be submitted 30 days prior to hauling any permanent material. The plan shall be updated as the contractor's plans change.
- D. Specific Traffic Considerations: The Project Manager may require the Contractor to revise the Traffic Control Plan to address traffic considerations not included in the Contractor's plan.

#### PART 2 - PRODUCTS

##### 2.01 TRAFFIC CONTROL DEVICES

- A. Such devices which include signs, delineators, striping, barriers, barricades and high level warning devices shall conform to the latest revision of the "Manual on Uniform Traffic Control Devices" and the latest revision of the CDOT Supplement thereto.

## **PART 3 - EXECUTION**

### **3.01 TEMPORARY TRAFFIC CONTROL DEVICES**

- A. Place temporary control devices in those locations that will enable traffic to traverse the area without hazard or abrupt changes in direction. Place traffic cones or delineators on not more than 35 foot centers. Operate warning lights between sunset and sunrise; place control devices so that approaching traffic is alerted to hazards and variances to normal traffic patterns. Place high rise warning flag units where motorist's visibility of warning devices, traffic signals, and pedestrian crosswalks will be either limited or obscured. Place barricades, cones and similar protective devices where personnel and equipment will be working within five feet of the edge of a lane bearing traffic. Clean and repair damaged devices or replace them with new devices as required.

### **3.02 TEMPORARY TRAFFIC STRIPING AND PAVEMENT MARKINGS**

- A. Stripe and mark bituminous and Portland cement pavement before diverting traffic. Maintain stripes and marks until permanent traffic marking and striping has been provided, or the temporary condition is no longer required. Remove temporary striping and marks when no longer required.

### **3.03 FLAGGERS**

- A. Furnish flaggers where construction equipment may intermittently encroach on traffic lanes, already existing haul routes, and where construction operations would affect public or construction safety and convenience and also where active haul roads cross existing access roads.

### **3.04 CONSTRUCTION VEHICULAR TRAFFIC**

- A. Restrict construction vehicles to approved haul routes.

### **3.05 CONTROLLING VEHICULAR AND PEDESTRIAN FLOW ADJACENT TO WORKSITE**

- A. Ensure that construction operations will not impede normal traffic. Where work is in the area of pedestrian or occupant activity, the Contractor shall erect barriers to prevent pedestrian intrusion into the worksite. The barriers will be a minimum of 42 inches in height and shall not be penetrable from floor or grade to the top of the barrier. Barriers erected in areas where there is a change in grade of over six inches shall meet barrier requirements as defined in the UBC and the DBC.

### **3.06 SIGNS**

- A. Coordinate and pay any expense associated with the furnishing and installation of all parking regulatory signs, such as "No Stopping Any Time," etc. at the worksite. The Contractor must contact the Project Manager a minimum of five working days in advance of construction for installation, relocation or removal of regulatory parking signs.
- B. Furnish and install any necessary advance detour or guidance signing.

- C. Authorize, modify and install regulatory parking controls and vehicle turn restrictions.
- D. Implement those traffic control modifications outside of the traffic control zone which are necessary to manage diverted traffic.

**PART 4 - MEASUREMENT**

**4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

**5.01 METHOD OF PAYMENT**

- A. Payment for Traffic Control under these schedules will be for work performed under the applicable work request lump sum bid item.

**END OF SECTION 01 55 25**

## SECTION 01 57 00

### ENVIRONMENTAL CONTROLS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. The Work specified in this Section consists of avoiding or mitigating adverse environmental impacts caused by construction activities in the areas of air quality, water quality, natural resources, and noise pollution. Reference the General Contract Conditions 806 (Protection of Drainage Ways), 807 (Protection of Environment), 808 (Hazardous and Explosive Materials or Substances), and 809 (Archeological and Historical Discoveries).  
<http://business.flydenver.com/community/enviro/documents/es301.pdf>
1. The Contractor, in conducting any activity on airport property or in conducting work for an airport project not on airport property, shall comply with all applicable airport, local, state, and federal rules, regulations, statutes, laws, and orders ("Environmental Requirements"). In addition, Environmental Requirements shall include applicable Environmental Guidelines developed for DIA's Environmental Management System (EMS), as summarized in the airport's Rules and Regulations Part 180 (Environmental Management), which can be located on the airport's website at:  
<http://business.flydenver.com/community/enviro/documents/es301.pdf> Information on DIA's EMS as well as current versions of DIA's Environmental Guidelines and Environmental Policy are also located on the airport's website at:  
<http://business.flydenver.com/community/enviro/index.asp> These Environmental Requirements address, but are not limited to, requirements regarding the management of hazardous materials, petroleum products, or any other substance; the National Environmental Policy Act (NEPA); and water quality and air quality regulations. Each entity, including subcontractors and subconsultants providing products, goods, and/or services on behalf of DIA, must be aware of the DIA Environmental Policy, the significant environmental aspects for DIA, and which of these aspects are relevant to the activities conducted by the entity.
  2. The Contractor shall comply with all Environmental Requirements and accept responsibility for compliance with all environmental quality standards, limitations and permit requirements promulgated thereunder. The Contractor shall obtain all environmental permits required for implementation of the project. Failure of these specifications to specifically mention any Environmental Requirement does not relieve the Contractor from compliance.
  3. If the City, as owner, is determined by any federal, state or local government agency, department, board or commission, or in any judicial proceeding to have violated any such environmental protection rules, laws or regulations as a result of Contractor's acts or omissions, the Contractor agrees to indemnify and hold harmless the City from any and all prosecutions, payment of any and all fines or penalties, and the cost of abatement and remediation, except that the Contractor shall not be required under General Contract Condition 807 to indemnify the City from any amounts which are attributable to the negligence of the City.
  4. Work shall not commence on any project until all FAA approvals have been received, applicable permits have been issued and signed by permittee, and all inspection requirements have been satisfied in accordance with State and local permitting requirements.

##### 1.02 SUBMITTALS

**ENGINEER SHALL NOT REDUCE THE REQUIREMENTS BELOW WITHOUT PERMISSION FROM THE DIA PROJECT MANAGER.**

- A. Refer to Technical Specifications Sections 01300 (Submittals) and 01340 (Shop and Working Drawings, Product Data and Samples) for procedures.
- B. Within 10 days after Notice to Proceed on a task order, the Contractor shall submit the following if applicable, unless waived by the DIA Project Manager:
  - 1. Submittals pertaining to water quality management:
    - a. Copy of the application completed for the City and County of Denver Construction Activities Stormwater Discharge Permit (CASDP) and the CASDP issued for the project by the Denver Department of Public Works. This submittal consists of three items: the Authorization to Discharge, the Sewer Use & Drainage Permit, and the approved Construction Activities Stormwater Management Plan (CASMP).
      - 1) Revisions or amendments to the CASMP by the Contractor. At the completion of the project, after final stabilization has been achieved and accepted in accordance with CASDP requirements, the Contractor shall submit a copy of the CASDP Inactivation Request.
    - b. Copy of the certification issued by the Colorado Department of Public Health and Environment (CDPHE) Water Quality Control Division (WQCD) under the Colorado Discharge Permit System (CDPS) for discharges associated with construction activities and/or industrial activities. Before obtaining this permit, the Contractor shall submit a **draft** permit application and the final permit application for DIA review and approval PRIOR to submittal to CDPHE. The Contractor need not submit copies of the general permits or the general permit rationales.
      - 1) At the completion of the project, after final stabilization has been achieved and accepted in accordance with the State of Colorado CDPS requirements, the Contractor shall submit a copy of the CDPS Inactivation Notice or Notice of Termination.
    - c. Copy of the certification issued by the State of Colorado CDPS under its General Permit for Construction Dewatering Activities. Before obtaining this permit, the Contractor shall submit a **draft** permit application and the final permit application for DIA review and approval PRIOR to submittal to CDPHE. The Contractor need not submit a copy of the general permit or the general permit rationale.
      - 1) At the completion of the project, the Contractor shall submit a copy of the CDPS Notice of Termination.
    - d. Copies of any certification issued by the State of Colorado under its Industrial Permitting program for minimal discharges of process wastewater. Before obtaining a permit, the Contractor shall submit a **draft** permit application and the final permit application for DIA review and approval PRIOR to submittal to CDPHE. The Contractor need not submit a copy of the issued permit or the permit rationale.
      - 1) The Contractor shall submit copies of Discharge Monitoring Reports (DMRs) and at completion of the project, the CDPS Notice of Termination.
    - e. A copy of the well permit from the state Division of Water Resources for every new well that diverts or for the monitoring of groundwater.
    - f. A copy of the Notice of Intent for any borehole structure filed with the state Division of Water Resources.
  - 2. Submittals pertaining to sewage holding tanks associated with buildings and trailers. For purposes of this Section 01566, the generic term "sewage holding tank" means "individual sewage disposal system (ISDS)", "privy vault", "septic tank", or "septic

- system”.
- a. Copy of the permit application for a sewage holding tank.
  - b. Copy of the Sewer Use & Drainage Permit issued by the Denver Department of Public Works.
  - c. Copy of the ISDS permit issued by the Denver Department of Environmental Health.
3. Submittals pertaining to air quality management:
- a. Copy of any permit issued by the CDPHE Air Pollution Control Division (APCD). Before obtaining a permit, the Contractor shall submit a **draft** permit application and the final permit application for DIA review and approval PRIOR to submittal to CDPHE.
    1. In cases where the City has already obtained a dust control permit, the Contractor shall submit a copy of the paperwork transferring the permit over to the Contractor’s company name and a copy of the transferred permit.
  - b. Dust control plan. For projects where the State of Colorado requires a dust control permit, this submittal is waived. This plan must address appropriate control measures that the Contractor will employ to minimize the release of fugitive dust from the site. In addition, the Contractor must comply with the requirements in Section 3.01 below.
  - c. Copies of the Notices of Relocation.
4. Submittals pertaining to storage tanks and containers:
- a. Copy of the approved application issued by the State of Colorado, Department of Labor and Employment, Division of Oil and Public Safety, for installation of petroleum (or other regulated substances) storage tanks located on airport property and used for the project.
  - b. Copy of permits issued by the Denver Fire Department for storage tank installations, storage tank removals, and hazardous materials use/storage.
  - c. Copy of Spill Prevention, Control, and Countermeasure (SPCC) Plan for petroleum storage tanks and containers with capacity of 55 gallons of oil or greater located on airport property and used for the project.
5. Copies of any other plans, permits, permit applications, correspondence with regulatory agencies (including violations), waste manifests, results of laboratory analyses, or other environmental documentation required for the project not previously identified.

### 1.03 RELATED DOCUMENTS

**EDIT TO INCLUDE APPLICABLE DOCUMENTS.**

- A. Code of Federal Regulations (CFR) Publications (including but not limited to):
1. 33 CFR 323 - Permits for discharges of dredged or fill materials into waters of the United States
  2. 40 CFR - Protection of Environment
  3. 49 CFR 171-180 Hazardous Materials Transportation Regulations
- B. Colorado Revised Statutes (including but not limited to):
1. Water Quality Control, Title 25, Article 8

2. Air Quality Control, Title 25, Article 7
  3. Hazardous Waste, Title 25, Article 15
  4. Noise Abatement, Title 25, Article 12
  5. Petroleum Storage Tanks, Title 8, Article 20.5
  6. Liquefied Petroleum Gas (LPG) Storage Tanks, Title 8, Article 20, Part 4
  7. Solid waste regulations
- C. City and County of Denver Executive Orders (including but not limited to)
1. Executive Order No. 115 – Required Use of Denver-Arapahoe Disposal Site (Landfill)
  2. Executive Order No. 123 – Greenprint Denver Office and Sustainability Policy
- D. Denver Revised Municipal Code, Title II, Sections 48-44 and 48-93 – Solid Waste
- E. City and County of Denver Construction Sites Program
- F. City and County of Denver Construction Activities Stormwater Management Plans Information Guide
- G. Any other applicable rules, regulations, ordinances, and guidance must be followed as applicable.
- H. Technical Specification section 01 33 00 and 01 33 25 for submittals procedures.
- I. Refer to DIA Technical Specification 01 74 19 for Waste Management Requirements

## PART 2 - PRODUCTS

### 2.01 PRODUCTS

- A. Products required for the work shall meet all Environmental Requirements.
- B. At a minimum, products for erosion and sediment control must conform to the technical requirements contained in the *City and County of Denver Construction Activities Stormwater Manual* and the current version of the Urban Drainage and Flood Control District's *Urban Storm Drainage Criteria Manual, Volume 3: Best Management Practices*. These documents are posted at:  
<http://denvergov.org/wastewatermanagement/WastewaterManagement/EngineeringandPermits/ErosionControl/tabid/442674/Default.aspx> and  
[http://www.udfcd.org/downloads/download\\_critmanual.htm](http://www.udfcd.org/downloads/download_critmanual.htm) respectively.

## PART 3 - EXECUTION

### 3.01 AIR POLLUTION CONTROLS

- A. The Contractor shall use appropriate control measures to comply with applicable air quality permit requirements. Additionally, the Contractor must be aware of the following procedures and techniques while conducting construction activities on DIA property. NOTE: Application of dust control measures should be discussed in the Dust Control Plan.
1. Apply water as needed to the construction site haul roads, disturbed surface areas

and public access roads as needed to suppress dust. The use of chemical stabilizer can be requested by the Contractor. The type of stabilizer to be used and locations of use must be included in the Dust Control Plan, which must be approved by the DIA PM prior to application.

2. The Contractor shall suspend all earthmoving activities if wind speed exceeds 30 mph. For purposes of this Section 01566, the generic term “earthmoving” means clearing, grubbing, excavation, topsoil removal, backfilling, embankment work, grading, trenching, drilling, and installation of borings. Contractors are expected to check wind speeds with the airport’s ramp tower to demonstrate compliance with this requirement. In addition, the project may be shut down if two of three of the Runway Visual Range (RVR) instruments read visibility of 2,400 feet or less. The instruments are used by FAA Control Tower personnel to ensure safe aircraft operations. Costs for shutdowns due to wind velocities or RVR readings shall not be grounds for delay or extra cost claims.

B. Burning of materials is strictly prohibited on DIA property.

### 3.02 WATER POLLUTION CONTROLS

- A. The Contractor shall conduct construction activities in accordance with all applicable permit requirements. In addition, the Contractor shall comply with the following procedures and requirements while conducting activities on DIA property.
  1. Water encountered during construction cannot be discharged to the stormwater system or placed onto the ground surface without a permit AND prior written approval by the DIA Project Manager. If groundwater or stormwater is anticipated to be encountered and the Contractor desires to discharge it to the stormwater system or onto the ground surface, then the Contractor must obtain an appropriate CDPS discharge permit in advance of the discharge unless this activity is specifically authorized under the CDPS Construction Stormwater Permit.
  2. If water is encountered and the Contractor desires to discharge these waters to the sanitary sewer system, then the Contractor must obtain approval from DIA Environmental Services in advance of the discharge.
  3. The Contractor shall ensure that stormwater that comes in contact with storage areas does not become impacted and discharged to the stormwater sewer system or to an impervious surface. Furthermore, any materials in storage areas shall not be stored directly on the ground (refer to DIA Technical Specification 16642 for Cathodic Protection Requirements).
  4. The Contractor shall not operate any valves, sluice gates or other drainage appurtenances related to any DIA sewer system without the prior approval of both the DIA Project Manager and DIA Environmental Services. Any violation of this directive may result in the payment of a financial penalty by the Contractor if the State of Colorado assesses such a penalty.

### 3.03 EROSION CONTROL AND SEDIMENTATION CONTROL

- A. This work consists of constructing, installing, maintaining and removing, if required, temporary and permanent control measures during the life of the contract (and possibly afterward) until the Contractor achieves final stabilization of the site to prevent or minimize erosion, sedimentation, and pollution of any state waters in accordance with all Environmental Requirements.



- B. The Contractor is responsible for compliance with all requirements in accordance with the CASDP, the City and County of Denver Construction Sites Program, the approved CASMP, and CDPS-issued permits.
- C. Temporary facilities, including but not limited to storage areas, laydowns, borrow areas, and contractor offices and work yards, shall be managed in accordance with DIA Technical Specification 01500 for Temporary Facilities.
- D. Clean soil fill may be stockpiled in any area that has been previously approved and signed off by the DIA Section Manager of Construction, Design and Planning, and Environmental Services. Soil stockpiles are considered a potential pollutant source and must be addressed in the CASMP and/or SWMP.
- E. Make immediately available, upon the DIA PM's request, all labor, material and equipment judged appropriate by the Project Manager to maintain suitable erosion and sediment control features. These actions requested by the DIA PM take precedence over all other aspects of project construction that have need of the same labor, material and equipment, except those aspects required to prevent loss of life or severe property damage.

### 3.04 CONSTRUCTION OF CONTROL MEASURES FOR EROSION AND SEDIMENTATION

- A. The Contractor must install control measures in accordance with the most recent version of the Urban Drainage and Flood Control District's *Urban Storm Drainage Criteria Manual, Volume 3: Best Management Practices* and the City and County of Denver Construction Activities Stormwater Manual. These documents are posted at: [http://www.udfcd.org/downloads/down\\_critmanual.htm](http://www.udfcd.org/downloads/down_critmanual.htm) and <http://denvergov.org/wastewatermanagement/WastewaterManagement/EngineeringandPermits/ErosionControl/tabid/442674/Default.aspx> respectively. Deviations from these two documents are allowed with written consent from the City and County of Denver NPDES Inspector.

### 3.05 STORAGE OF OIL, FUELS, OR HAZARDOUS SUBSTANCES

- A. The Contractor shall prevent oil or other hazardous substances (as defined in federal and state regulations) from entering the ground, drainage or local bodies of water, and shall provide containment, diversionary structures, or equipment to prevent discharged oil from reaching a watercourse and take immediate action to contain and clean up any spill of oily substances, petroleum products, or hazardous substances. The Contractor shall provide one or more of the following preventive systems at each petroleum storage site:
  - 1. Dikes, berms, or retaining walls capable of containing at least 100% of the volume of the largest single tank and equipped with sufficient freeboard to contain precipitation events. The secondary containment must be "sufficiently impermeable" to prevent a release to the environment.
  - 2. Culverting, curbing, guttering or other similar structures capable of containing at least 100% of the volume of the largest single tank and freeboarding from precipitation.
- B. The provision of such preventive systems shall be subject to acceptance by the DIA PM prior to tank installation and shall follow the SPCC regulations (40 CFR Part 112).
- C. Prior to bringing any containers of 55-gallon or above capacity onto DIA property for storage of oil, fuel, or other petroleum substances, the Contractor may be required to prepare an SPCC Plan that conforms to 40 CFR Part 112. The plan must include either a certification from a Professional Engineer or self-certification (if applicable), as well as management approval from the legally responsible Contractor representative.

### 3.06 SPILL RESPONSE AND NOTIFICATION

- A. The Contractor is responsible for all spills that may result from its activities. For ANY suspected or confirmed release or spill of oil, fuel, solid waste, hazardous waste, unknown materials, lavatory waste, or miscellaneous chemicals, etc. that occurs as the result of the Contractor's activities on DIA property, the Contractor is required to take immediate action to mitigate the release or spill and report it to the DIA Project Manager and to the DIA Communications Center at (303) 342-4200.
- B. The Contractor is responsible for notifying the appropriate regulatory agency(ies) in the event suspected and/or confirmed releases are identified, in accordance with regulatory requirements.

### 3.07 SITE REMEDIATION AND RESTORATION

- A. The Contractor shall be required to perform any necessary site assessment and remediation activities required by applicable regulatory agency(ies).
- B. During routine construction activities, the Contractor is required to manage soils using typical construction techniques. The Contractor must differentiate between soils and wastes (including contaminated soils versus clean soils) and determine those materials that can remain on DIA property and those that must be transported offsite for disposal.
- C. During all construction activities that require the management of soils, the Contractor must notify the Project Manager and DIA Environmental Services (ES) that soils being managed may be impacted by industrial activities conducted at the airport. "Process knowledge" pertaining to previous use and/or impact for the location(s) under construction can be used to determine whether impacted soils are probable. Also, common indices such as soil staining and odor can be used as a determination for the probable condition. If probable contamination conditions are suspected, the Contractor will notify the Project Manager and DIA ES immediately. At that time (which may be before the work is initiated where indicative conditions exist), all work will cease until a sampling and analysis approach is determined and implemented by the proper responder.
- D. If the site conditions warrant based on evidence of spillage or contamination, process knowledge, and/or visual or olfactory observations, the Contractor may be required to conduct sampling and analysis to confirm that no remedial action is required. Prior to conducting any removal activities, the Contractor must provide a Scope of Work to the DIA PM describing the proposed site assessment activities.
- E. The impacted project will modify its operation to include a segregation area where probable impacted soils can be placed, stored, and sampled for characterization. Should the soil materials be determined to exceed the applicable standards, the Project Manager, in conjunction with DIA ES, will be responsible for the proper disposal of these materials. Materials that are determined to contain contamination levels below the applicable standards can be considered clean soils and placed back into the excavation or reused elsewhere on DIA property. In accordance with Section 3.06, materials removed that are suitable for recycling will be placed within areas designated on DIA to store these materials.
- F. The Contractor shall restore any area on the Airport which becomes contaminated as a result of its operations. Restoration shall be either to applicable standards under federal and state law or to such other levels as may be required by the Manager of Aviation, at the Manager's sole discretion. Such restoration shall be completed at the earliest possible time, and the Contractor's restoration shall be subject to inspection and approval by the Manager of Aviation or her duly authorized representative (see DIA Rules & Regulations – Part 180).

## **PART 4 - MEASUREMENT**

### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

## **PART 5 - PAYMENT**

### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid items. The Contractor shall be responsible for payment of all fees associated with review of environmental permit applications and processing of environmental permits.



## **SECTION 01 58 10**

### **TEMPORARY SIGNS**

#### **PART 1 - GENERAL**

##### **1.01 CONSTRUCTION SIGNAGE VISIBLE TO THE PUBLIC.**

##### **1.02 TEMPORARY DIRECTIONAL, INFORMATIONAL OR REGULATORY SIGNAGE.**

##### **1.03 QUALITY CONTROL**

- A. Construction and other temporary signage visible to the public must be commercial grade quality, professionally fabricated and installed for the location of the sign. The contractor is responsible to maintain this signage until it is no longer needed.

#### **PART 2 - PRODUCTS**

##### **2.01 GENERAL**

- A. Interior signs that are visible and not physically accessible to the public may be made of rigid board, such as "Gator Board" with vinyl messages. All edges must be finished and conceal all attachments.
- B. Interior signs that are visible and physically accessible by the public must be vandal-proof. Acceptable examples of vandal-proof signs are messages applied second surface with concealed tamperproof fasteners.
- C. Exterior signs must be vandal-proof and fabricated of weatherproof materials.

#### **PART 3 - EXECUTION**

##### **3.01 HARDWARE**

- A. Interior Signs: Attach with suitable adhesive and/or tape which may be removed with out damage to finishes.
- B. Exterior Signs: Must be secured to withstand site conditions and varying weather conditions.

##### **3.02 SIGN FINISHES, MATERIALS AND PAINT**

- A. Provide temporary signage to reflect permanent sign design and/or as directed by the Signage Design Project Manager. Submit temporary sign finishes, materials and paint, etc., for review and approval prior to any fabrication.

##### **3.03 MAINTENANCE**

- A. The Contractor is responsible to maintain temporary signage until it is no longer needed.

##### **3.04 REMOVAL**

- A. The contractor is responsible to remove all temporary signs, clean and refurbish affected areas to their original (or intended) condition.

**PART 4 - MEASUREMENT**

**4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

**5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item.

**END OF SECTION 01 58 10**

## SECTION 01 66 10

### STORAGE AND PROTECTION

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. The Work specified in this Section consists of providing storage and protection of the materials, products and supplies which are to be incorporated into the construction and indicating such storage areas on the working drawings with the location and dates when such areas will be available for each purpose.

##### 1.02 SUBMITTALS

- A. Refer to Technical Specifications Sections 01 33 00 and 01 33 25 for submittal procedures. Submit concurrently with submittals required in Section 01 32 23 layout of work and survey.
- B. Submit working drawings showing locations of storage areas not indicated on the Contract Drawings.
- C. Submit descriptions of proposed methods and locations for storing and protecting products.

#### PART 2 - PRODUCTS

##### 2.01 MATERIALS

- A. Materials required for the storage and protection of the items specified shall be durable, weatherproof and either factory finished or painted to present an appearance acceptable to the City. Storage facilities shall be uniform in appearance with similar materials used to the maximum extent possible.

#### PART 3 - EXECUTION

##### 3.01 GENERAL REQUIREMENTS OF EXECUTION

- A. Palletize materials, products and supplies which are to be incorporated into the construction and stored off the ground. Material and equipment shall be stored only in those areas that are indicated as storage areas on the contract drawings and on the reviewed and accepted working drawings. Store these items in a manner which will prevent damage and which will facilitate inspection. Leave seals, tags and labels intact and legible. Maintain access to products to allow inspection. Protect products that would be affected by adverse environmental conditions.
- B. Periodically inspect stored products to ensure that products are being stored as stipulated and that they are free from damage and deterioration.
- C. Do not remove items from storage until they are to be incorporated into the Work.
- D. The Contractor shall ensure that all protective wrappings and coverings are secure and ballasted to prevent any items from deterioration and/or subsequent dislodgment. All items on the worksite that are subject to becoming windborne shall be ballasted or anchored.

##### 3.02 HANDLING AND TRANSPORTATION

- A. Handling
  - 1. Avoid bending, scraping or overstressing products. Protect projecting parts by blocking with wood, by providing bracing or by other approved methods.
  - 2. Protect products from soiling and moisture by wrapping or by other approved means.
  - 3. Package small parts in containers such as boxes, crates or barrels to avoid dispersal and loss. Firmly secure an itemized list and description of contents to each container
- B. Transportation
  - 1. Conduct the loading, transporting, unloading and storage of products so that they are kept clean and free from damage.

### 3.03 STORAGE

- A. Store items in a manner that shall prevent damage to the owner's property. Do not store hydraulic fluids, gasoline, liquid petroleum, gases, explosives, diesel fuel and other flammables in excavations, except one day's supply of diesel fuel may be stored in open excavations.
- B. Provide sheltered weather-tight or heated weather-tight storage as required for products subject to weather damage.
- C. Provide blocking, platforms or skids for products subject to damage by contact with the ground.
- D. All material shall be stored according to the manufacturer's recommendations. Any material that has to be stored within specified temperature or humidity ranges shall have a 24-hour continuously written recording made of the applicable condition. Should the recording show that the material was not stored within the recommended ranges the material shall be considered defective and in nonconformance. If a certification from the manufacturer's engineering design representative is provided stating that the actual variations are acceptable and will in no way harm the material or affect warranties, then the deficiency will be considered corrected.
- E. Store hazardous material separately, with all material marked with a label showing the hazard and how to treat exposure to the material.

### 3.04 LABELS

- A. Storage cabinets and sheds that will contain flammable substances and explosive substances shall be labeled FLAMMABLE--KEEP FIRE AWAY and NO SMOKING with conspicuous lettering and conforming to OSHA requirements.

## PART 4 - MEASUREMENT

### 4.01 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

## PART 5 - PAYMENT

### 5.01 METHOD OF PAYMENT



- A. The cost of the Work described in this Section shall be included in the applicable unit price item, work order, or lump sum bid item. See Technical Specifications Section 01370 for additional requirements for the possible payment of stored material.

**END OF SECTION 01 66 10**

## SECTION 01 66 30

### SUBSTITUTIONS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. The Work specified in this Section consists of submitting for the approval of a different material, equipment or process then is described in the Contract Documents. The Contractor is to use the Request for "Or Equal" Approval form found in the Instructions to Bidders before submitting his bid. The Request for Substitution form, found in Section 01 99 00, is used after the Contractor receives his Notice to Proceed.
- B. If the substitution changes the scope of work, contract cost or contract time, a change order is required. As-built drawings and specifications must include all substitutions even if a change order is not issued.

##### 1.02 QUALITY CONTROL

- A. The substitution must provide the same quality as what it is replacing. The level of quality is defined by:
  - 1. Maintenance and operating cost
  - 2. Reliability
  - 3. Durability
  - 4. Life expectancy
  - 5. Ease of cleaning
  - 6. Ability to be upgraded as needed
  - 7. Ease of interacting with other systems or components
  - 8. Ability to be repaired
  - 9. Availability of replacement parts
  - 10. Established history of use in similar environments
  - 11. Performance equal or superior to that which it is replacing.

##### 1.03 SUBMITTAL

- A. Refer to Technical Specifications Sections 01 33 00 and 01 33 25 for submittal procedures.
- B. A complete Request for Substitution using the form in Section 01 99 90 must be made at least 60 days prior to when an order needs to be placed or a method needs to be changed.
- C. The submittal shall contain, as appropriate, detailed product data sheets for the specified items and the substitution. Samples and shop drawings shall also be submitted of the substitution as applicable. The submittal shall contain all the data required to be submitted for acceptance of the originally specified item or process.
- D. The submittal shall contain all the applicable information required in Technical Specifications Section 01630, paragraph 2.01 below.

- E. A signed statement as outlined in Technical Specifications Section 01 66 30, paragraph 2.03.B below must accompany the Request for Substitution.

## **PART 2 - EXECUTION**

### **2.01 INFORMATION**

- A. Provide the following information as applicable with the Request for Substitution on the item or process that is being requested to be substituted:
1. A complete description of the item or process
  2. Utility connections including electrical, plumbing, HVAC, fire protection and controls
  3. The physical dimensions and clearances
  4. A parts list with prices
  5. Samples of color and texture
  6. Detailed cost comparisons of the substitution and the contract specified item or process
  7. Manufacturer warranties
  8. Energy consumption over a one-year period
  9. What local organization is certified to maintain the item
  10. Performance characteristics and production rates
  11. A list of any license fees or royalties that must be paid
  12. A list of all variations for the item or method specified
  13. A list of at least three other projects of similar nature to this contract where the products or methods have been in use for at least one year including telephone number and name of the person to contact at these other projects
  14. An analysis of the effect of the substitution on the schedule and contract cost and on the overall project as it relates to adjoining work.

### **2.02 SUBSTITUTION REQUEST**

- A. The formal Request for Substitution will be evaluated by the PMT Project Manager and the Designer of Record based on the following criteria:
1. Compatibility with the rest of the project
  2. Reliability, ease of use and maintenance
  3. Both initial and long term cost
  4. Schedule impact
  5. The willingness of the Contractor to share equally in any cost savings
  6. The ability of the item or process to meet all applicable governing regulations, rules and laws along with funding agency requirements
  7. The cost of evaluating the substitution.
- B. Based upon the above evaluation the Deputy Manager of Aviation will make a final determination of what is in the best interest of the City and either approve, disapprove or approve as noted the requested substitution.

## **2.03 CONDITIONS**

- A. As a condition for submitting a Request for Substitution the Contractor waives all rights to claim for extra cost or change in contract time other than those outlined in the request and approved by the Deputy Manager of Aviation. The Contractor, by submitting a Request for Substitution, also accepts all liability for cost and scheduling impact on other contractors or the City due to the substitution.
- B. Included with the Request for Substitution shall be the following statement:
  - 1. "The substitution being submitted is equal to or superior in all respects to the contract-required item or process. All differences between the substitution and the contract-required item or process are described in this request along with all cost and scheduling data."
- C. The statement shall be signed and dated by the Contractor's Superintendent.

## **PART 3 - EXECUTION (NOT USED)**

## **PART 4 - MEASUREMENT**

### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

## **PART 5 - PAYMENT**

### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or the lump bid item.

**END OF SECTION 01 66 30**

## **PART 1 – GENERAL**

### **1.01 SUMMARY**

1. This section describes the requirements for recycling and construction waste management for construction and demolition work.
2. All wastes shall be managed in accordance with local, state, and federal regulations.
3. The contractor shall recycle 100 % by weight of concrete, asphalt, and metal; the contractor shall recycle at least 75% by weight of all other recyclable and salvageable materials.

### **1.02 RELATED SECTIONS**

- A. Technical Specification Section 01 33 00 and 01 33 25 for submittal procedures.
- B. Technical Specification 01 57 00 Environmental Control.
- C. Technical Specification 01 81 13 Sustainable LEED Requirements.

### **1.03 DEFINITIONS**

- A. Salvaged Materials are defined as waste materials or materials that exist on the site that can be reused, either on site or by another entity.
- B. Recyclable Waste is defined as all waste materials that exist on site or are generated during the construction process that can be recycled and/or remanufactured into another material. Recyclable waste includes:
  - concrete,
  - ferrous and non-ferrous metals,
  - untreated wood, engineered wood,
  - gypsum wallboard,
  - corrugated cardboard, paper goods,
  - plastic,
  - glass, insulation,
  - carpet,
  - paints, fabric,
  - rubber,
  - stone and brick,
- C. Non-Recyclable Waste is defined as all waste material that is not able to be recycled due to

contamination, lack of recycling facilities, or salvage options, or high cost.

- D. High Cost is defined as the cost to dispose of solid waste at a landfill plus 20%.
- E. Hazardous Waste is defined at 40 CFR 261.3, and 6 CCR 1007-3 as a solid, a liquid, or a contained gaseous material that is no longer used or that no longer serves the purpose for which it was produced and meets the definitions of the regulations.

#### 1.04 SOLID WASTE MANAGEMENT

- A. This paragraph applies to solid waste. Solid waste is defined at 40 CFR 261.2 and includes all putrescible and non-putrescible solid, semisolid and liquid wastes, but does not include hazardous waste which is treated as a separate subset of solid waste. Hazardous waste is defined at 40 CFR 261.3, and 6 CCR 1007-3 as a solid, a liquid, or a contained gaseous material that is no longer used or that no longer serves the purpose for which it was produced and meets the definitions of the regulations. Certain types of non-hazardous solid waste may require special handling; such wastes are sometimes called “special waste.”
- B. Hazardous and special solid waste may be generated by the actions of the Contractor including, but not limited to, the direct purchase of hazardous materials, demolition, site preparation, grading, excavation, construction, or maintenance of equipment. If questionable material is encountered during construction activities, the Contractor must immediately notify the DIA Communications Center at (303) 342-4200 and the DIA Project Manager (PM). Refer to Technical Specification 01566 for additional information regarding the storage of hazardous substances.
- C. Remove scrap and waste material and dispose of it in accordance with laws, codes, regulations, ordinances, and permits.
- D. The Contractor is responsible for the safe management and disposal of all hazardous and non-hazardous solid waste and shall dispose of such waste in accordance with all environmental requirements. Waste disposal options include reuse on the project (with DIA approval only), sale, use for fuel, donation to other public or private projects, or through disposal in approved disposal sites, either free of charge or for a fee. The method of disposal is restricted according to the classification of the waste. Hazardous and non-hazardous solid waste shall not be abandoned, dumped, buried or in any other way disposed on DIA property.
- E. City and County of Denver Executive Order No. 115 requires all non-recyclable non-hazardous solid waste generated at DIA to be directed to the Denver Arapahoe Disposal Site (DADS) landfill. This includes all non-hazardous solid waste collected or transported in Denver vehicles, Contractor vehicles, or subcontractor vehicles. Through the DIA Project Manager, the Contractor shall establish accounts in advance for the disposal of non-hazardous solid waste generated on the project. Therefore, this bid shall include costs for transportation to the DADS landfill only and the City is responsible for disposal fees and any applicable State surcharges. The Contractor is responsible for any special handling charge imposed by the transporter or the DADS landfill operator.

NOTE: To establish contractor accounts, the DIA PM shall follow procedures outlined in ES-308-06.03: *Municipal and Special Solid Waste Administrative Management Work Instruction*.

- 1. In the interest of public relations and to maximize the long-term use of the Site, haul routes adjacent to DADS shall be limited to State Highway 30 or E-470 unless these routes are impassable (refer to Exhibit A for preferred haul route). Specifically, Gun Club Road between Interstate Highway 70 (“I-70”) and Mississippi Avenue shall be

avoided.

- F. Some of the naturally occurring material found by the Contractor, especially tar or oil-impregnated soil, may not be obviously hazardous. Physical and chemical analyses and tests may be required to determine if the material meets the criteria set forth in State of Colorado, CDPHE, Hazardous Materials and Waste Management Division (HMWMD) regulations. The Contractor shall pay for such chemical analyses and will coordinate with local authorities to determine the quantity and origin of samples analyzed for any questionable material. The Contractor will provide the classification of the material to the City.
- G. The routes to be followed when transporting solid or hazardous wastes may be subject to the approval of the local agency having jurisdiction.
- H. The Contractor shall not wash down equipment in such a manner as to flush grease and oils into the project site or onto airport property unless the waste is properly contained, treated, and disposed.
- I. The Contractor shall maintain copies of MSDSs for any and all materials used at the airport project, at its on-site project office or other designated location. DIA Environmental Services may, at any time, request copies of MSDSs and/or waste manifests for any waste shipments from the project site. Any such request must be fulfilled within 1 business day.
- J. The Contractor shall require all shipments to the worksite to contain documentation that shows whether the material is hazardous or requires special handling, storage, or disposal; what type of material it is; what hazard(s) it poses; how to treat exposure(s); and the quantity of hazardous material in the shipment. This information must be provided to the DIA PM prior to any hazardous material being allowed on site.
- K. Before leaving the site with any hazardous waste or material requiring special handling, storage or disposal, the Contractor must provide the DIA PM with a detailed description of the material, its source, quantity, who is hauling it off site, and where it is being taken, along with verification that the destination site can legally receive it.

#### 1.05 WASTE MANAGEMENT PLAN

- A. The Contractor shall submit a Waste Management Plan within 10 days of NTP to the PM and DIA Environmental Services that meets these minimum requirements:
  - 1. Contractor's name and contract number;
  - 2. Include a communication plan that will describe how the waste management plan will be conveyed to each new subcontractor that comes onto the site and how containers will be identified.
  - 3. A list of all materials, products, and wastes generated by the project; materials that require special handling or storage for environmental, safety, or fire code reasons; and acknowledgment whether any of the wastes will become regulated wastes upon disposal. The list of materials, products, and wastes may include, trash and unclassified construction debris, asphalt spoils, concrete spoils, pavement sweepings, soils contaminated by chemicals or petroleum products during the project, lime and cement trimmings, scrap metal, and every chemical product used on the project. Reuse of a product on site for its original intended purpose (e.g., cement trimmings from one part of the project used elsewhere on the airport) does not constitute generation of a waste for disposal.
  - 4. A copy or an electronic link to MSDSs for any and all materials used.

5. A list of salvaged materials and recyclable waste. The list should detail the measures taken to salvage and/or recycle waste.
6. Identify and justify non-recyclable waste. Justification for non-recyclable waste should include at a minimum: cost and/or logistical obstacles that preclude a contractor from salvaging or recycling the waste. This justification must be approved by DIA Environmental Services.
7. For each material and product listed, the Contractor shall identify the storage method, and identify measures to store hazardous waste separately from non-hazardous waste.
8. For each waste listed, the Contractor shall identify the handling/transportation method, the disposal method, and the disposal facility utilized.
9. If the Contractor anticipates generation of hazardous waste, the Contractor shall provide its USEPA (generator) identification number.
10. Describe project practices which will reduce waste at the source, such as requiring vendors to deliver materials in reusable packaging.
11. Tonnage calculations that demonstrate the contractor will meet the Waste Management Goals to recycle, reuse, or salvage the demolition materials generated. Calculation shall be done by weight (tons).
12. Pollution prevention measures.
13. Training measures for management of hazardous materials and hazardous wastes on site.
14. Approval of Contractor's Waste Management Plan will not relieve the Contractor of responsibility for compliance with applicable environmental regulations.

#### 1.06 CONSTRUCTION DEBRIS RECYCLING

- A. The contractor shall salvage or recycle all materials and wastes as defined in 1.03. The Contractor is responsible for coordinating all aspects with regard to recycling. The Contractor is encouraged to contact DIA Purchasing or DIA Environmental Services for information regarding recycling policies and practices.
- B. Dry concrete and asphalt materials are to be recycled. DIA maintains two dry concrete and asphalt recycling yards used for the accumulation and crushing of these materials. The only allowable materials at the recycle yards are dry concrete and asphalt materials derived from construction activities occurring on DIA property. The South Yard is located on 71<sup>st</sup> Ave just east of Jackson Gap Street. The North Yard is located on the south side of 110<sup>th</sup>, west of Queensburg Street. The use of these yards must be approved by the DIA PM.
  1. Concrete washout activities are prohibited anywhere on DIA property unless a) the activity is specifically authorized under a CDPS permit and included in the SWMP or b) the wash-water is collected and hauled offsite for disposal at an appropriately permitted facility. Concrete washout activities authorized by permit are only allowed at a designated concrete washout area as indicated in the approved CASMP and include the washing of the chute and tools ONLY. Concrete washout spoils are eligible for recycling once the washout has been segregated and allowed to dry and harden in accordance with permitted methods.
  2. Rejected loads and/or other wet concrete or asphalt materials are prohibited to be placed ANY WHERE on DIA property unless the Contractor holds a permit that authorizes the placement of such material on the site. Unless specifically authorized



in a CDPS permit issued to the Contractor, these materials must be returned to the facility of origination or other permitted facility for proper disposal.

3. A Recycle Materials Manifest is required to be filled out by the Contractor for each load of concrete or asphalt placed in these areas and given to the responsible Project Manager. It will be the responsibility of the Contractor to ensure the accuracy and completeness of the manifests. The Contractor will also be responsible for instituting controls to ensure that only the manifested materials are placed in the approved site. If two or more Contractors have material going into a site at the same time, they will need to coordinate their efforts to ensure that only approved and manifested materials are allowed on the site.
4. A copy of all manifests must be turned in on a monthly basis to the PM and DIA Environmental Services. A copy of the Recycled Materials Manifest form is available from the DIA PM.

#### **1.07 SUBMITTALS**

- A. The Contractor shall submit a Disposal and Recycling Summary Report once a month to the PM and DIA Environmental Services, quantifying the construction and demolition waste generated and recycled, reused, salvaged or disposed of on a monthly basis. This Disposal and Recycling Summary Report shall be in the format of Appendix A: The Contractor shall include the recycled materials manifests; weight tickets, receipts, and invoices specifically identifying the Project and waste material.
- B. The contractor shall submit a Waste Management Plan within 10 days of NTP to the Project Manager and DIA Environmental Services. See Section 1.06 for Waste Management Plan Requirements. Products (not used)

#### **PART 2 - PRODUCTS (NOT USED)**

#### **PART 3 - EXECUTION**

#### **3.01 IMPLEMENTATION OF WASTE MANAGEMENT PLAN**

- A. The Contractor is fully responsible to comply with all laws and regulations applicable.
- B. The City will deduct any fines, back-charges or any associated costs due to the Contractor's lack of compliance with all rules law and regulations.

**THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL IMPACTS OF THE CONSTRUCTION ACTIVITIES BASED ON A PERFORMANCE BASIS AND WILL BE REQUIRED TO BE PROACTIVE TO AVOID ANY FORESEEABLE NEGATIVE IMPACT WHETHER NOTED IN THE APPROVED PERMIT CONDITIONS ON THE PLANS OR WHETHER IT IS REQUIRED AS PART OF THE PERMIT OR NOT.**

#### **PART 4 - PAYMENT**

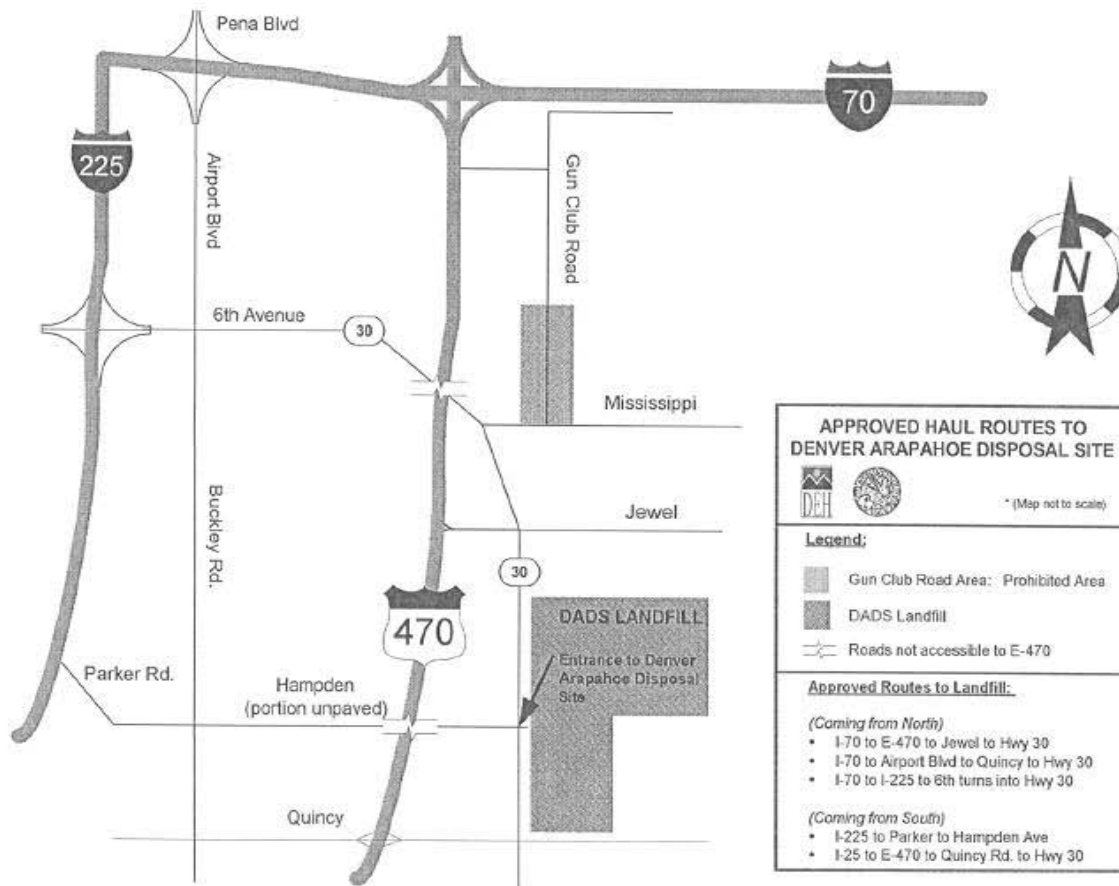
#### **4.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item. The Contractor shall pay all applicable and charges as shown in Appendix B of this Section. Where the Contract Bid items assigns an allowance line item; The Contractor will be paid on actual invoices for recycling costs but no time will be paid more than the cost of waste dump at landfill plus 20% and hauling.

**NOTE:** Concrete and asphalt waste materials are considered a potential pollutant source and must be addressed in the CASMP and/or SWMP.

**EXHIBIT A**

MAP OF ROUTE TO DADS LANDFILL



**VOLUME 1 TECHNICAL SPECIFICATIONS**  
**i. DIVISION 1 GENERAL REQUIREMENTS**  
**SECTION 01 74 19 – CONSTRUCTION WASTE MANAGEMENT**

**DENVER INTERNATIONAL AIRPORT**  
**DIA Data Center**  
**CONTRACT NO. 201207370**

**Appendix A. Monthly Summary of Solid Waste Disposal and Diversion**

Project Name _____					Project Number _____		
Contractor Name _____					License Number _____		
Contractor Address _____							
Month/year _____							
<b>Solid Waste Material</b>	<b>Recycled, Reused, Salvaged or Disposed</b>	<b>Date Material Disposed/ Diverted</b>	<b>Amount Disposed (Tons)</b>	<b>Amount Diverted (Tons)</b>	<b>Municipal Solid Waste Facility</b>	<b>Recycling /Reuse Facility</b>	<b>Comment (If disposed, state why not diverted.)</b>
Concrete	1		n/a		n/a		
Ferrous/nonferrous metals			n/a		n/a		
Asphalt			n/a		n/a		
Untreated wood/engineered wood							
gypsum wall board							
corrugated cardboard, paper goods			0	0			
plastic			0				
glass, insulation							
carpet							
Paints							
fabrics							
Rubber							
Stone and brick							
<b>Diversion rate (excluding concrete metal, and asphalt)</b>				<b>#DIV/0!</b>			
All receipts or equivalent for salvage, recycling, reuse, and disposal are hereby attached. This project has recycled all of the concrete and asphalt and at least 75% of all other debris generated.							
Contractor signature _____					Date _____		
DIA Approval: _____							

Appendix B

**Schedule of Prices (2012)**

Excludes Applicable Taxes and Fees:

<b>Incoming Recyclable Rubble</b> Clean, uniform size, pre break and stokpiled.	Price	Unit
Weigh and inspect Incoming Rubble	\$0.46	per ton
<24" Rubble size	\$2.20	per ton
>24" Rubble Size	\$5.75	per ton
Structural Reinforced Rubble	\$13.30	per ton
Reinforced Concrete Pipe	\$8.95	Lin Ft.
<b>Ougoinig Recycled Material</b>		
Class 6- CDOT recycled Concrete Base	\$5.20	per ton
Class 6- CDOT recycled asphalt Base	\$5.10	per ton
Class 5- CDOT recycled Concrete Base	\$5.20	per ton
Class 5- CDOT recycled asphalt Base	\$5.10	per ton
Class 1 - CDOT Structural Fill	\$4.46	per ton
-2" x 3/4" Concrete Dry Screened Stone	\$11.50	per ton
-4" x 2" Concrete Dry Screened Stone	\$10.55	per ton
ASTM (#57/#67) Concrete Dry Screened	\$15.20	per ton
DIA Stone (6" & 12")	\$16.10	per ton
3/8" Fines	\$3.15	per ton
Load Recycled Material (Out- Going)	\$0.79	per ton
Weigh Recycled Material (Out-Going)	\$0.46	per ton

## SECTION 01 74 20

### CLEANING

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. The Work specified in this section consists of maintaining a clean, orderly, hazard free worksite during construction, and final cleaning for the City's Final Acceptance. Failure to maintain the worksite will be grounds for withholding monthly payments until corrected to the satisfaction of the Project Manager.

##### 1.02 JOB CONDITIONS

A. Safety Requirements

1. Maintain the worksite in a neat, orderly and hazard-free manner in conformance with all federal, state and local rules, codes, regulations and orders, including all OSHA requirements, until Final Acceptance of the Work. Keep catwalks, underground structures, worksite walks, sidewalks, roadways and streets, along with public and private walkways adjacent to the worksite, free from hazards caused by construction activities. Inspect those facilities regularly for hazardous conditions caused by construction activities.

B. Hazards Control

1. Store volatile wastes in covered metal containers and remove those wastes from worksite daily.
2. Do not accumulate wastes which create hazardous conditions.
3. If volatile and noxious substances are being used in spaces that are not naturally ventilated, provide artificial ventilation.
4. Hazard controls shall conform to the applicable federal, state and local rules and regulations.
5. Provide appropriate waste receptacles in all areas in which employees are working. Waste receptacles shall be kept covered at all times. All materials on site shall be anchored and covered to prevent any objects from becoming wind-borne.

C. Access

1. Maintain the worksite to permit access by other City contractors as required and to allow access by emergency personnel.

##### 1.03 SUBMITTALS

- A. Washing Plan. The Contractor shall prepare a plan describing the specific procedures and materials to be utilized for any equipment, vehicle, etc. washing activities. The plan must be submitted to the PM and also approved by the PM and Environmental Services. Outdoor washing at DIA is not allowed unless the materials will be collected or managed in a manner to ensure that they will not enter the municipally-owned separate storm sewer system (MS4). The materials can only be disposed at a location pre-approved by DIA Environmental Services (refer to DIA SWMP). Failure to comply with this requirement would result in the

discharge of non-stormwater. Indoor washing must be conducted in accordance with the Best Management Practices (BMPs) detailed in the DIA SWMP. Refer to Technical Specification 01 57 00. In addition, all indoor washing must be conducted in a manner that ensures that there are no prohibited discharges to the sanitary sewer system.

## **PART 2 - PRODUCTS**

### **2.01 CLEANING MATERIALS**

- A. Utilize the type of cleaning materials recommended by the manufacturer for the surfaces to be cleaned.
- B. Maintain current Material Safety Data Sheets (MSDS) on site for all chemicals. DIA Environmental Services must approve the chemicals used prior to discharge to the sanitary sewer system.
- C. Ensure proper disposal of all wastes generated from the use of these materials. Must ensure compliance with all environmental regulations. No wastes can be disposed on DIA property.

## **PART 3 - EXECUTION**

### **3.01 INTERIM CLEANING**

- A. Clean the worksite every shift/workday for the duration of the construction contract. Maintain structures, grounds, storage areas and other areas of worksite, including public and private properties immediately adjacent to worksite, free from accumulations of waste materials caused by construction operations. Place waste materials in covered metal containers. All hard concrete, steel, wood and finished walking surfaces shall be swept clean daily.
- B. Remove or secure loose material on open decks and on other exposed surfaces at the end of each workday or more often in a manner that will maintain the worksite hazard free. Secure material in a manner that will prevent dislodgment by wind and other forces.
- C. Sprinkle waste materials with water or acceptable chemical palliative to prevent blowing of dust.
- D. Promptly empty waste containers when they become full and legally dispose of the contents at dumping areas off the City's property.
- E. Control the handling of waste materials. Do not permit materials to be dropped or thrown from structures.
- F. Immediately remove spillage of construction related materials from haul routes, work site, private property, public rights of way, or on the Denver International Airport site.
- G. Clean only when dust and other contaminants will not precipitate upon newly painted surfaces.
- H. Cleaning shall be done in accordance with manufacturer's recommendation.
- I. Cleaning shall be done in a manner and using such materials as to not damage the Work.
- J. Clean areas prior to painting or applying adhesive.

- K. Clean all heating and cooling systems prior to operations. If the contractor is allowed to use the heating and cooling system it shall be cleaned prior to testing.
- L. Clean all areas that will be concealed prior to concealment.
- M. Dispose of all fluids according to the approved Washing Plan.

### **3.02 FINAL CLEANING**

- A. Inspect interior and exterior surfaces, including concealed spaces, in preparation for completion and acceptance.
- B. Remove dirt, dust, litter, corrosion, solvents, discursive paint, stains and extraneous markings.
- C. Remove surplus materials, except those materials intended for maintenance.
- D. Remove all tools, appliances, equipment and temporary facilities used in the construction.
- E. Remove detachable labels and tags. File them with the manufacturer's specifications for that specific material for the City's records.
- F. Repair damaged materials to the specified finish or remove and replace.
- G. After all trades have completed their work and just before Final Acceptance, all catch basins, manholes, drains, strainers and filters shall be cleaned; roadway, driveways, floors, steps and walks shall be swept. Interior building areas shall be vacuum cleaned and mopped.
- H. Final cleanup applies to all areas, whether previously occupied and operational or not.
- I. Dispose of all fluids according to the approved Washing Plan.

## **PART 4 - MEASUREMENT**

### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

## **PART 5 - PAYMENT**

### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item.

**END OF SECTION 01 74 20**



## SECTION 01 75 15

### SYSTEM STARTUP, TESTING AND TRAINING

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION OF WORK

- A. Provide complete startup, testing and operator training services to ensure operability of all electrical and electronic equipment supplied.

##### 1.02 SUBMITTAL

- A. PMT Project Manager Refer to Technical Specifications Sections 01 33 00 and 01 33 25 for submittal procedures.
  - 1. Test procedures
  - 2. Test report
  - 3. Training outline.

##### 1.03 FIELD TESTS AND ADJUSTMENTS

- A. All electrical and mechanical equipment including the interfaces with control systems and the communication system, and all alarm and operating modes for each piece of equipment shall be tested by the Contractor to the satisfaction of the DIA Project Manager before any facility is put into operation. Tests shall be as specified herein and shall be made to determine whether the equipment has been properly assembled, aligned and connected. Any changes, adjustments or replacements required to make the equipment operate as specified shall be carried out by the Contractor as part of the work.
  - 1. At least 30 days before the time allowed in the construction schedule for commencing startup and testing procedures, the Contractor shall submit to the DIA Project Manager six copies of the detailed procedures he proposes for testing and startup of all electrical and mechanical equipment. These procedures are submitted for review and acceptance.
  - 2. The Contractor's startup and testing procedures shall include detailed descriptions of all pre-operational hardware, electrical, mechanical and instrumentation used for testing work. Each control device, item of electrical, mechanical and instrumentation equipment, and all control circuits shall be considered in the testing procedures which shall be designed in a logical sequence to ensure that all equipment has been properly serviced, aligned, connected, wired, calibrated and adjusted prior to operation. Motors shall be tested in accordance with ANSI/IEEE Publication 112. The Contractor is advised that failure to observe these precautions may place the acceptability of the subject equipment in question, and he may either be required to demonstrate that the equipment has not been damaged, or replace it as determined by the PMT Project Manager.
  - 3. Testing procedures shall be designed to duplicate as nearly as possible all conditions of operations and shall be carefully selected to ensure that the equipment is not damaged. All filters shall be in place during startup and testing. Once the DIA Project Manager has accepted the testing procedures, the Contractor shall provide checkout, alignment, adjustment and calibration signoff forms for each item of equipment and each system that will be used. The Contractor and the DIA Project Manager shall use the signoff

forms in the field jointly to ensure that each item of electrical, mechanical and instrumentation equipment and each system has been properly installed and tested. The Contractor shall cooperate with project wide systems contractors where startup and testing is to be conducted concurrently.

4. Any special equipment needed to test equipment shall be provided to the City at no cost for a period of 30 days during startup.
- B. Before starting up the equipment, the Contractor shall properly service it and other items, which normally require service in accordance with the maintenance instructions. The Contractor shall be responsible for lubrication and maintenance of equipment and filters throughout the entire equipment "break-in" period described by the manufacturer.
  1. The Contractor shall be responsible for the startup, adjustment, preliminary maintenance and checkout of all equipment and instrumentation. All systems shall be carefully checked for conformance with the design criteria.
  2. If any equipment or system does not operate as specified in the contract, the Contractor shall immediately replace or repair components until it operates properly.
  3. The Contractor shall submit a test report to the PMT Project Manager within 30 days after completion of the system startup period.

#### 1.04 SYSTEMS STARTUP AND TESTING

- A. The Contractor shall be responsible for a 30-day startup period during which time all hardware, electrical and mechanical equipment, communications, alarm systems and associated devices shall be energized and operated under local and automatic controls. The Contractor shall be present during the startup period with adequate labor and support personnel to adjust equipment and troubleshoot system failures that might arise.
- B. When a piece of electrical or mechanical equipment is found to be in conflict with specific criteria, an experienced representative of the manufacturer shall make an adjustment to the item.
- C. If adjustments fail to correct the operation of a piece of equipment or fixture, the Contractor shall remove the equipment or fixture from the project site and replace it with a workable replacement that meets the specification requirements.
- D. The 30-day startup period shall commence 30 days prior to the contract completion date and shall be completed prior to final payment. If, during the startup, any system fails to operate in accordance with contract requirements, the failure shall be corrected and the startup period shall begin again. At the end of the startup period, all filters shall be replaced with new ones. The City may, at its option, provide a Commissioning Representative to observe or participate in the startup and testing of any system. The Contractor shall coordinate with the Commissioning Representative relating to scheduling, reporting, forms, methods and procedures of the startup and testing.

#### 1.05 FINAL INSTRUCTIONS AND OPERATION TRAINING

- A. After startup and testing is completed, the Contractor shall demonstrate to the City's personnel the proper manner of operating the equipment, programming messages, making adjustments, responding to alarms and emergency signals, and maintaining the system.
- B. The Contractor shall provide on-the-job training by a suitably qualified instructor to designated

personnel and shall instruct them in the operation and maintenance of the systems. In the event qualified instructors on the Contractor's staff are not available, the Contractor shall arrange with the equipment manufacturer for such instruction at no additional cost to the City.

- C. The Contractor shall provide a minimum of 16 hours of maintenance training to the Airport. Classes shall accommodate up to five people at a time.
- D. The Contractor shall provide a minimum of 8 hours of operator training to the Airport. Classes shall accommodate up to five people at a time with up to two separate courses (one for each shift).
- E. The Contractor shall provide a syllabus to the DIA Project Manager at least seven calendar days prior to the start of each course that outlines topics to be covered, the proposed time allotted to each topic, and the target audience of the training session (technical, casual operator, overview, etc.). The Contractor shall not commence any training courses until the syllabus has been reviewed and approved by the PMT Project Manager.
- F. The Contractor shall videotape all training sessions and provide labeled digital video disks (DVD) to the DIA Project Manager. The Contractor shall provide three copies of the DVD to the PMT Project Manager in DVD+R format. All disks shall be labeled using the LightScribe technology.
- G. The Contractor shall provide an annotated syllabus to the PMT Project Manager that indicates topics contained on each tape.

**PART 2 - PRODUCTS (NOT USED)**

**PART 3 - EXECUTION (NOT USED)**

**PART 4 - MEASUREMENT**

**4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

**PART 5 - PAYMENT**

**5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or the lump bid item. No contractual item requiring startup or testing will be paid until the conditions of this Section are completely satisfied.

**END OF SECTION 01 75 15**

**SECTION 01 77 20**  
**CONTRACT CLOSEOUT**

**PART 1 - GENERAL**

**1.01 DESCRIPTION**

- A. Work specified in this Section includes procedures required prior to Final Acceptance of the Work in addition to those specified in General Conditions Title 20 and Technical Specifications Section 01 78 40.

**1.02 PREPARATION FOR FINAL INSPECTION**

- A. Before requesting inspection for Final Acceptance of the Work by the City, inspect, clean and repair the Work as required.
- B. All applicable items of the Closeout checklist has been addressed and accepted by DIA Project Manager.

**1.03 FINAL INSPECTION**

- A. When the Contractor considers that the Work is complete, he shall submit written certification that:
  - 1. Work has been inspected by the Contractor for compliance with contract documents.
  - 2. Work has been completed in accordance with contract documents.
  - 3. Work is ready for final inspection by the City.
  - 4. All as-built required documents have been submitted and accepted.
  - 5. All damaged or destroyed real, personnel; public or private property has been repaired or replaced.
  - 6. All operation and maintenance manuals have been submitted and accepted and all training has been completed.
  - 7. All personnel badges and vehicle permits have been returned to DIA Airport Security.
- B. The Project Manager will inspect to verify the status of completion with reasonable promptness after receipt of such certifications. The inspection of the work will be done in accordance with the General Conditions.
- C. If the Project Manager finds incomplete or defective work:
  - 1. The Project Manager may, at the Project Manager's sole discretion, either terminate the inspection or prepare a punch list and notify the Contractor in writing, listing incomplete or defective work.
  - 2. The Contractor shall take immediate steps to remedy stated deficiencies and send a second written certification to the Project Manager that Work is complete.
  - 3. The Project Manager will then reinspect the Work.

**1.04 REINSPECTION FEES**

- A. Should the Project Manager perform reinspection due to failure of the Work to comply with the claims of status of completion made by the Contractor:
  - 1. The Contractor shall compensate the City for such additional services at the rate of \$100.00 per man-hour.
  - 2. The City shall deduct the amount of such compensation from the final payment to the Contractor.

#### **1.05 FINAL ADJUSTMENT OF ACCOUNTS**

- A. Submit a Final Statement of Accounting to the Project Manager.
- B. The Final Statement of Accounting shall reflect all adjustments to the contract amount and shall include the following:
  - 1. The original contract amount.
  - 2. Additions and deductions resulting from:
    - a. Previous change orders.
    - b. Allowances.
    - c. Final quantities for unit price items. Along with this statement shall be detailed backup for the quantities.
    - d. Deductions or corrected work.
    - e. Penalties.
    - f. Deductions for liquidated damages.
    - g. Deductions for re-inspection payments.
    - h. City resurveys required due to the Contractor.
    - i. Other adjustments.
  - 3. Total contract amount, as adjusted.
  - 4. Previous payments.
  - 5. Sum remaining due.
- C. If required, the Project Manager will prepare a final change order, reflecting approved adjustments to the Contract sum which were not previously made by change orders.

#### **1.06 FINAL APPLICATION FOR PAYMENT**

- A. The Contractor shall submit the final application for payment in accordance with the procedures and requirements stated in the General Conditions Title 20.

#### **PART 2 - PRODUCTS (NOT USED)**

#### **PART 3 - EXECUTION (NOT USED)**

#### **PART 4 - MEASUREMENT**

##### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

#### **PART 5 - PAYMENT**

##### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order, or lump sum bid item.

**END OF SECTION 01 77 20**

## SECTION 01 78 35

### WARRANTIES AND BONDS

#### PART 1 - GENERAL

##### 1.01 DESCRIPTION

- A. The Work specified in this Section consists of preparing and submitting warranties and bonds required by these specifications.

##### 1.02 SUBMITTALS

- A. Refer to Technical Specifications Section 01 33 00 for submittal procedures.
- B. Submit executed warranties and bonds.

#### PART 2 - PRODUCTS (NOT USED)

#### PART 3 - EXECUTION

##### 3.01 WARRANTIES AND BONDS

- A. Execute the warranties and bonds required by the Contract Documents. Prepare and submit a list of all warranties and bonds on the form provided by the City. Reference Technical Specifications Section 01 99 90.
- B. Provide warranties or bonds for the materials, labor and time period set forth in the sections of these specifications requiring such documents. All warranties shall be for a minimum period of one year unless the technical specifications for a specific item require a greater period of time.
- C. Provide all warranties and bonds that the manufacturer or supplier furnishes at no additional cost in regular commercial trade. All warranties shall be for a minimum period of one year unless the technical specifications for a specific item require a greater period of time.

#### PART 4 - MEASUREMENT

##### 4.01 METHOD OF MEASUREMENT

- A. No separate measurement shall be made for work under this Section.

#### PART 5 - PAYMENT

##### 5.01 METHOD OF PAYMENT

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item.

END OF SECTION 01 78 35

## SECTION 01 99 90

### STANDARD FORMS

#### PART 1 - GENERAL

##### 1.01 FORMS

- A. The forms listed below and appended to this Section will be used for performance of the Work as indicated. This is not a complete listing of all required forms. The Contractor shall properly complete all forms required by the contract or the Project Manager. The Project Manager shall review and approve all submitted forms. If submitted forms are not acceptable the Contractor shall resubmit forms in an acceptable format.

##### 1.02 APPENDICES

- A. Attached to this Technical Specifications Section are the following forms:
1. Daily Quality Control Report (Form CM-13) (1 Page)
  2. Request for Information (Form CM-17) (1 Page)
  3. Submittal Transmittal Form (Form CM-30) (Page 1 of 2)
  4. Submittal Transmittal Form (Form CM-30) (Page 2 of 2)
  5. Contractor Warranty (Form CM-10) (4 Pages)
  6. Contractor/Subcontractor Warranty (Form CM-11) (4 Pages)
  7. Contractors Certification of Payment (Form CM-19) (this form shall be completed and submitted with each pay application) (1 Page)
  8. Pay Application Form (CM-18) (1 Page)
  9. Certificate of Current Cost or Pricing Data (Form CM-69) (1 Page)
  10. Subcontractor Partial Lien Release Form (Form CM-26) (1 Page)
  11. Subcontractor Final Lien Release Form (Form CM-70) (1 Page)
  12. Request for Substitution (Form CM-09) (5 pages)
  13. Closeout Check List (CM-75)
  14. System Shutdown Request Forms:
    - a. AGTS and Baggage Systems
    - b. Airfield Systems
    - c. CCTV Security Systems
    - d. Electrical Power and Lighting
    - e. Elevator, Escalator and Autowalk
    - f. Fire Protection Plumbing
    - g. HVAC Systems
    - h. Temperature Control Systems
    - i. Life Safety/ Fire Alarm Systems
    - j. Plumbing



- k. Roadways
- l. Security
- m. Sterile Public Areas
- n. X-Ray

## **PART 2 - PRODUCTS (NOT USED)**

## **PART 3 - EXECUTION**

### **3.01 COMPLETING FORMS**

- A. All documents are to be filled digitally by the Contractor using the format provided by the Project Manager or using Adobe Acrobat 6 or newer. It is at the discretion of the Project Manager if other forms or formats will be accepted.

### **3.02 SIGNING FORMS**

- A. Original hand written signatures are acceptable for all documents. The Contractor is to fill out the document as indicated above prior to signing the hard copy. If the form is to be submitted digitally to the Project Manager the document shall be scanned and saved as an Adobe Acrobat 6 or newer file.
- B. Digital signatures are acceptable for all documents. The Contractor is to fill out the document digitally in the format provided by the Project Manager or Adobe Acrobat 6 or newer. The file must be signed using Adobe Acrobat 6 or newer and submitted digitally to the Project Manager.
  - 1. Add digital signatures must contain the name of signer in plain text and the time and date the signature is executed.

## **PART 4 - MEASUREMENT**

### **4.01 METHOD OF MEASUREMENT**

- A. No separate measurement shall be made for work under this Section.

## **PART 5 - PAYMENT**

### **5.01 METHOD OF PAYMENT**

- A. No separate payment will be made for work under this Section. The cost of the work described in this Section shall be included in the applicable unit price item, work order or lump sum bid item.

**END OF SECTION 01 99 00**

# **EXHIBIT J**

## **DRAWINGS AND SPECIFICATIONS** (To be Determined)

**DIA Data Center**

**Contract Number 201310374**

**June 2013**

**DEPARTMENT OF AVIATION  
City & County of Denver**



**DENVER INTERNATIONAL AIRPORT**

**AIRPORT INFRASTRUCTURE MANAGEMENT**

# **EXHIBIT K**

## **MINORITY AND WOMEN BUSINESS ENTERPRISE PARTICIPATION MBE/WBE COMPLIANCE PLAN**

**DIA Data Center**

**Contract Number 201310374**

**June 2013**

**DEPARTMENT OF AVIATION  
City & County of Denver**



**DENVER INTERNATIONAL AIRPORT**

**AIRPORT INFRASTRUCTURE MANAGEMENT**

**CITY AND COUNTY OF DENVER  
DIVISION OF SMALL BUSINESS OPPORTUNITY  
CONSTRUCTION CONTRACT COMPLIANCE PLAN  
FOR M/WBE PARTICIPATION**

**PCL Construction Services, Inc.  
DIA Data Center  
CONTRACT NO. 201310374**

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**CITY AND COUNTY OF DENVER**  
**DIVISION OF SMALL BUSINESS OPPORTUNITY**  
**CONSTRUCTION CONTRACT COMPLIANCE PLAN**  
**FOR M/WBE PARTICIPATION**

**PCL Construction Services, Inc.**  
**DIA Data Center**  
**CONTRACT NO. 201310374**

**SECTION 1: INTRODUCTION**

- A. **PCL Construction Services, Inc.** (the “Contractor”) submits this Compliance Plan to the Director of the Division of Small Business Opportunity (“Director”), as required by the Manager of Aviation, in accordance with §§ 28-51 to 28-83, D.R.M.C., and the implementing rules adopted by the Director (“Rules”).
- B. Under the City’s Ordinance No. 760, Series of 2006 (the “M/WBE Ordinance”), codified at §§ 28-51 to 28-83, D.R.M.C., the M/WBE participation goal for this contract is **2** %. The good faith solicitation level is 100%
- C. The Contractor is committed to compliance with the M/WBE Ordinance in its performance of the Contract. The Contractor will continually pursue a level of M/WBE participation that equals or exceeds **2** % of the total construction price under the Contract.
- D. Because of the delivery method used for this Project, the work was not ready for subcontracting at the time when the Contractor was awarded the Contract. Therefore this Compliance Plan provides for the M/WBE solicitation and subcontracting to be performed after contract formation. The process by which the Contractor will solicit, obtain, count and maintain participation by MBE and WBE firms for this Project under this Compliance Plan, will be same as the M/WBE Ordinance requires for “design-bid-build” construction contracts.
- E. This Compliance Plan describes how the Contractor will address the project goal at the point where the project work is sufficiently defined that the process of obtaining subcontractors and suppliers can begin, by committing to utilize MBE/WBEs for the Project work, using the good faith efforts as defined by the M/WBE Ordinance.
- F. The delivery method for this project under the Contract is **design/build**.
- G. The Contractor **will** deliver the construction work in phases. [If the work will be delivered in phases, Section 3 below describes the Contractor’s plan to meet the project goal as it relates to such phases.]

## SECTION 2: KEY PERSONNEL

**Vincent Straub, 303-365-6574, [jvstraub@pcl.com](mailto:jvstraub@pcl.com),** has been assigned as the **Design-Build Manager** for this Contract. The **Design-Build Manager** is responsible for the overall management of the Contractor's performance of the Project.

**Christina Simpson, 303-365-6433, [clsimpson@pcl.com](mailto:clsimpson@pcl.com),** is the **Accountant**, who will administer subcontracts and ensure that all documentation required by DSBO is prepared and maintained. **Christina** will coordinate the collection of DSBO documentation and monthly payroll reports from all subcontractors and suppliers, including but not limited to M/WBEs.

## SECTION 3: STRUCTURING BID PACKAGES FOR M/WBE PARTICIPATION

- A. The Contractor has identified preliminarily the following separate packages of work to be subcontracted:

*[Display the information in chart form. Examples are provided below for your use.  
Customize the form so that it provides the information specific to your project.  
The total at bottom needs to be the contract total.  
Showing subtotals along the way for completely different types of work is acceptable.  
Force accounts and contingency fees may be deducted from the total goals are met upon.  
The overall committed contract goal is the percentage stated on page 1. ]*

### GOALS SCHEDULE CHART

		Total Contract Scope Value		Estimated Potential MWBE Participation	
Workscope	Tier	Total Contract \$	Total Contract %	\$ of Listed Scope	% of Constr Services
<b>Total – Potential MWBE Construction Services</b>					

GOALS SCHEDULE CHART				
AVAILABLE SUB-TRADE	APPROXIMATE DOLLAR AMOUNT	PERCENT-AGE OF TOTAL PROJECT	ASSIGNED MWBE GOAL PER SECTION	ANTICIPATED RESULTING MWBE PARTICIPATION
Earthwork/Site Demo				
Utilities				
Paving				
Landscape & Irrigation				
Concrete				
Masonry				
Metals				
Carpentry				
Thermal & Moisture				
Doors & Windows				
Finishes				
Specialties				
Mechanical				
Electrical				
<b>SUBTOTAL</b>				
Design				
Self-Performance				
<b>TOTAL</b>				

- B. These packages will be reviewed and refined as the work for the Contract is further defined and ready for the process of subcontracting. Specifically, prior to advertising any package of work for bids or proposals, the Contractor will review the work in detail, to determine the types of work that can be performed by M/WBE firms, with reference to the DSBO's database and directory of certified M/WBE firms, and will adjust its subcontracting packages to maximize opportunities for M/WBE participation in such subcontracting, within economically feasible packages.
- C. The Contractor has the following preliminary schedule for issuance of each bid package:  
  
**The Site and Foundations bid packages will be issued for bids approximately 60 days after receipt of the Notice to Proceed.**
- D. **No specific or potential issues with the contract's scope of work are anticipated.**
- E. **PCL will prequalify subcontractors through our Subguard Insurance Program which exams a subcontractors financial and construction capabilities. Subcontractors who pass the scrutiny of PCL's Subguard Program are not required to provide a performance and payment bond. This program allows M/WBE subcontractors to free up valuable bonding capacity for other projects.**
- F. The Contractor may pursue different percentage goals for M/WBE participation in each separate package of work put out for bids, based on the types of work and availability of certified M/WBE firms. However, the Contractor is committed to the overall goal of **2%** M/WBE participation in the total construction work amount.
- G. The Contractor may consider, in order to maximize M/WBE participation, subcontracting the following types of work which it might ordinarily self-perform: **Form, place and finish concrete.**

#### **SECTION 4: COMMUNITY OUTREACH EFFORTS AND ADVERTISING TO M/WBE CERTIFIED FIRMS:**

The Contractor will conduct the following outreach efforts:

- A. Contractor will use the City's M/WBE directory and encourage all non-M/WBE subcontractors to use the directory when soliciting any of their own subcontractors or suppliers for the project.
- B. If during outreach efforts, Contractor locates a firm which appears to be eligible for City M/WBE certification but is not so certified, Contractor will direct the firm to DSBO and encourage the firm to pursue certification if eligible.
- C. When it has work packages ready for subcontracting, the Contractor will publish notices in The Daily Journal and other local publications and websites, identifying the subcontracting opportunities and specifically soliciting City-certified M/WBE



participation. The Contractor will also provide notice of all such solicitations to relevant organizations such as, but not limited to, the Colorado Black Chamber of Commerce, Rocky Mountain Minority Supplier Development Council, Hispanic Contractors of Colorado, and the Colorado Women's Chamber of Commerce. Notices will be published or provided no less than 10 calendar days before bids are due on the work.

- D. Contractor will conduct at least one pre-bid meeting, as announced in published notices, which all interested subcontractors and suppliers may attend, at which the Contractor will present information and answer questions about the work.
- E. **[Identify any additional efforts or initiatives the Contractor will carry out.] PCL regularly conducts M/WBE and Small Business outreaches in both our Denver and Mountain offices. We anticipate having 2-3 of these events between now and the time the project is ready for bidding. PCL will present information and answer questions about this project during these meetings. This is in addition to the pre-bid meeting in Section 4.D above.**

**PCL will utilize iSqFt to search for and solicit M/BWE subcontractors and suppliers which may not have been identified during other outreach efforts.**

- F. **[Describe the bid/proposal process that will be used.] During the design phase PCL will prepare a preliminary list of qualified subcontractors for each trade. As the bid packages are finalized PCL will advertise in the publications and websites identified in Section 4.C and subsequently conduct a pre-bid meeting per Section 4.D. Bid dates and times will be established for each trade. Subcontractors may be required to submit satisfactory evidence that they have a practical knowledge of the particular work proposed upon and that they have the necessary financial resources to complete the proposed work. The lowest, responsible subcontractors will be selected.**
- G. The Contractor will send to each bidder/proposer, a Notice of Selection for each subcontract for which it solicited M/WBE participation, no later than 30 days after it has entered into the subcontract, so that unsuccessful bidders/proposers are aware of the result of the bid/proposal process.

## **SECTION 5: M/WBE PARTICIPATION; MAINTAINING COMMITMENTS**

- A. When issuing each work package for bid under the Contract, the Contractor will make a good faith effort to meet or exceed the goal percentage of M/WBE participation which it has identified for that package. The minimum level of these efforts is specified in § 28-62(b), D.R.M.C. and Rule VII(B). They may include, but will not be limited to, the outreach activities identified in Section 4 above.
- B. When requested by DSBO, the Contractor will submit bid packages to DSBO for review and comment. When requested by DSBO, the Contractor will submit bid tabulation sheets to DSBO for review.

- C. The Contractor will report to DSBO the total M/WBE participation obtained for each bid package. No later than 5 days after issuing Notice to Proceed for such work, the Contractor will submit to DSBO, for each M/WBE subcontractor or supplier with whom it contracts, a Letter of Intent and other documentation, in accordance with Section \_ below.
- D. The Contractor will document its efforts to obtain M/WBE participation for each work package, and submit such documentation to DSBO upon request by DSBO at any time. The Contractor acknowledges that it may meet or exceed a percentage goal for M/WBE participation on one or more work packages, but fall short of meeting the participation goal for the total construction contract amount. Therefore the Contractor must be able to demonstrate its good faith effort, consistent with § 28-62(b), D.R.M.C., to obtain M/WBE participation for each bid package under the contract, except for bid packages which are subject to a “modified good faith effort” under § 28-75(c), D.R.M.C., in which case the Contractor must be able to demonstrate its compliance with the requirements of § 28-75(c), D.R.M.C. Sections 28-62(b) and 28-75(c), D.R.M.C., are attached to this Compliance Plan as Attachment 1, for convenient reference.
- E. The M/WBE participation percentage will be calculated by dividing the total value of the M/WBE participation by the total contract amount for the project, including all change orders. The Contractor will count M/WBE participation according to the M/WBE Ordinance, including § 28-63, D.R.M.C., and Rule VII(C).
- F. As required by D.R.M.C. § 28-73, the Contractor shall immediately inform the DSBO in writing of any agreed-upon increase or decrease in the scope of work of the Contract, regardless of whether it has been reduced to writing at the time of notification. Any increase in the scope of work which increases the dollar value of the contract, whether or not such change is within the scope of work designated for performance by an MBE or WBE under any subcontract, shall be contemporaneously submitted to the DSBO. Those changes to the scope of work that cannot be performed by existing project participants (the Contractor, subcontractors, suppliers, etc.) shall be subject to a goal for MBEs and WBEs equal to the original committed goal. The Contractor shall satisfy the goal for the changed scope of work by soliciting new MBEs or WBEs in accordance with § 28-60, D.R.M.C, and it must show each element of modified good faith that is stated in § 28-75(c), D.R.M.C. The Contractor shall provide to the Director the documentation described in § 28-75(c) with respect to the increased dollar value of the contract..
- G. The Contractor will comply with the provisions of § 28-75 as to the replacement of a WBE or MBE on the Project.
- H. The Contractor acknowledges that it has a continuing duty, under D.R.M.C. §§ 28-72, 28-73, and 28-75, to maintain, throughout the duration of the contract, compliance with the level of MBE and WBE participation committed to under any approved compliance plan, and that such commitment is a material condition of the Contract.

## **SECTION 6: COMPLIANCE DOCUMENTS AND REPORTING**

A. The Contractor will submit the following documentation, properly completed and submitted monthly or when otherwise required by DSBO.

1. Prime contractor background information form\*
2. DSBO Schedule of Work form\*
3. Subcontractor background information form for all subcontractors\*
4. M/WBE Letters of Intent
5. Monthly contractor's certification of payment forms (participation report)
6. DSBO change order forms
7. M/WBE final lien release forms
8. B2G online payment verification

(\*due at NTP + 5 days; revisions as required)

B. The Contractor will document its progress in seeking and obtaining M/WBE participation as required by DSBO. Records of the Contractor's efforts to solicit M/WBE subcontractor and supplier participation, will be maintained and reported monthly to DSBO, or as otherwise required, including:

1. Dates of solicitation
2. Names, addresses and telephone numbers of all M/WBE firms contacted.
3. Description of efforts made to contact M/WBE firms.
4. Description of information provided to M/WBE firms.
5. Description of the process and outcome.
6. Advertisements soliciting bids from M/WBE firms in local community publications or construction industry related publications.
7. Schedules of prebid meetings to inform M/WBE and non-M/WBE subcontractors and suppliers of opportunities to participate.
8. Evidence that the Contractor provided M/WBE subcontractors and suppliers necessary access to and adequate time to review all project documents.
9. All other documentation required to establish the Contractor's compliance with the good faith efforts required by City ordinance, specifically the items enumerated in subsections 28-62(b)(2) through 28-62(b)(10). D.R.M.C.

## **SECTION 7: PLAN ADMINISTRATION; MONITORING; CLOSEOUT**

A. DSBO shall have prompt, full and complete access to all Contractor and subcontractor personnel, books and records required to monitor and assure performance of this Compliance Plan.

B. The Contractor's personnel identified in Section 2 above, will be responsible for administering and monitoring the Contractor's performance of this Compliance Plan.

- C. Actual M/WBE participation will be calculated in accordance with the M/WBE Ordinance, including § 28-63, D.R.M.C., and applicable Rules. The Contractor will submit to DSBO a monthly tracking report demonstrating the M/WBE participation that has been achieved. .
- D. The following milestones for review and reconciliation of M/WBE participation will be observed during the contract: **Upon receipt of Site and Foundation Bids, at 50-75% completion of construction, and upon completion of the project. We will also review and reconcile the M/WBE participation in the event of any large additive or deductive change in the project scope, particularly as it relates to a M/WBE Subcontractor.**
- E. The Contractor acknowledges that the City may impose monetary penalties and/or withhold payment in the event of Contractor's non-compliance with the M/WBE Ordinance and this Compliance Plan.
- F. The Contractor will use the following methodology for final reconciliation of M/WBE participation performance achieved during the Contract term, measured against the established project goal. The Contractor will present copies of all signed DSBO Final Lien Release forms for MWBE firms utilized for participation on the Contract. DSBO will compare the Final Monthly Participation Report submitted by the Contractor to determine if the Final Lien Release dollar figures match what is contained within the Final Monthly Participation Report. Final Compliance shall be achieved when the Contractor establishes to the Director's satisfaction, that it has remitted payments to M/WBE firms utilized on the Project; that it utilized M/WBE firms in accordance with each such firm's Letter of Intent; and that the amount of payments to M/WBE firms equals or exceeds the assigned M/WBE goal for the total amount of the Contract. Failure to achieve final compliance may subject the Contractor to sanctions, in accordance with D.R.M.C, Section 28-77. As provided in such ordinance, sanctions may include, but are not limited to, assessment by the Director of a monetary penalty against the Contractor in an amount not more than 150% of the contract amount for each MBE or WBE involved. Any such monetary penalty leveled by the Director shall be withheld from the final payment due to the Contractor, and any amount that remains due and owing to the City may be collected pursuant to D.R.M.C., Section 28-77. The Contractor may seek review of any such determination by the Director to levy sanctions through the dispute resolution process set forth in the Construction Contract.

## **SECTION 8: NON-COMPLIANCE; SANCTIONS; REMEDIATION PLAN**

- A. At all times, DSBO shall monitor the Contractor's compliance with this Plan and the M/WBE Ordinance and Rules. The Contractor shall fully cooperate with DSBO's compliance monitoring and auditing efforts, including DSBO's investigation of any alleged or suspected non-compliance by the Contractor.

- B. If the Director has reason to believe that the Contractor is not in compliance with this Plan or with the M/WBE Ordinance, the Director shall give the Contractor written notice of non-compliance, citing the reasons why the Contractor is not in compliance, and giving the Contractor thirty (30) days in which to submit a remediation plan for the Director's review and acceptance. The remediation plan shall demonstrate how the Contractor will cure such non-compliance, and if such non-compliance consists of failure to obtain or maintain M/WBE participation at the committed level, that the Contractor's M/WBE participation level will again achieve the committed level, and that the Contractor will ultimately achieve the committed participation goal for the contract..
- C. The Contractor shall, within such thirty (30) day period, deliver to the Director a written remediation plan the Director's review and approval.
- D. The Director may issue a written determination of non-compliance and the sanction which the Director has elected to impose as a consequence:
  - (1) If the Contractor does not respond within the time allowed; or
  - (2) If the Contractor fails to submit a satisfactory remediation plan; or
  - (3) If a Contractor submits an acceptable remediation plan but thereafter fails to comply with the plan.
- E. The Contractor may contest a determination issued under Section 8(D), by requesting a hearing within 30 days after the date of such determination, as provided in § 28-33, D.R.M.C.

## **SECTION 9: MEDIATION**

The Contractor will provide a process to resolve disputes that occur between a MBE or WBE and any non-M/WBE subcontractors or suppliers under the Contract. The Contractor will document such disputes and inform DSBO of the steps the Contractor plans to take to resolve the dispute. The Contractor may ask DSBO to assist in the resolution process it has developed. The Contractor will document and notify DSBO if those disputes have been resolved and inform DSBO of any disputes it was unable to resolve. DSBO will notify the Contractor of any complaints received by DSBO from M/WBE firms regarding a dispute they are experiencing with either a subcontractor or the Contractor.

## ATTACHMENT 1

### EXCERPTS FROM DENVER REVISED MUNICIPAL CODE

#### *Sections 28-62(b) and 28-75(c), D.R.M.C*

#### **Sec. 28-62. Same--Good faith efforts.**

(b) The statement of good faith efforts shall include a specific response and verification with respect to each of the following good faith effort categories, which may be further defined by rule or regulation. A bidder or proposer may include any additional information it believes may be relevant. Failure of a bidder or proposer to show good faith efforts as to any one (1) of the following categories shall render its overall good faith effort showing insufficient and its bid or proposal non-responsive:

- (1) If prebid or preselection meetings are scheduled by the city at which MBEs and WBEs may be informed of subcontracting or joint venture opportunities under a proposed contract to be bid, or procured pursuant to the competitive selection process, attendance at such prebid or preselection meetings is not mandatory; however, bidders and proposers are responsible for the information provided at these meetings.
- (2) The bidder or proposer must solicit through all reasonable and available means, the interest of all MBEs and WBEs certified in the scopes of work of the contract. The bidder or proposer must solicit the interest of such MBEs and WBEs within sufficient time, prior to the bid opening or date of final project-specific proposal in the case of a competitive selection process, to allow such MBEs and WBEs to respond to the solicitation. The bidder or proposer must determine with certainty if the MBEs and WBEs are interested by demonstrating appropriate steps to follow up initial solicitations.
- (3) The bidder or proposer must select portions of the work of the contract to be performed by MBEs and WBEs in order to increase the likelihood that the project goal will be achieved. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate MBE and WBE participation as subcontractors or joint venturers, and for bidder or proposer self-performed work, as suppliers, manufacturers, manufacturer's representatives and brokers, all reasonably consistent with industry practice, even when the bidder or proposer would otherwise prefer to perform these work items with its own forces. The bidder or proposer must identify what portions of the contract will be self-performed and what portions of the contract will be opened to solicitation of bids, proposals and quotes from MBE and WBEs. All portions of the contract not self-performed must be solicited for MBE and WBE participation. The ability or desire of a bidder or proposer to perform the work of a contract with its own forces does not relieve the bidder or proposer of the responsibility to meet the project goal or demonstrate good faith efforts to do so.
- (4) The bidder or proposer, consistent with industry practice, must provide MBEs and WBEs at a clearly stated location with timely, adequate access to and information about the plans, specifications, and requirements of the contract, including bonding and insurance requirements, if any, to assist them in responding to a solicitation.

- (5) The bidder or proposer must negotiate in good faith with interested MBEs and WBEs and provide written documentation of such negotiation with each such MBE or WBE.
- (6) For each MBE or WBE which contacted the bidder or proposer or which the bidder or proposer contacted or attempted to subcontract or joint venture with, consistent with industry practice, the bidder or proposer must supply a statement giving the reasons why the bidder or proposer and the MBE or WBE did not succeed in negotiating a subcontracting, supplier, manufacturer, manufacturer's representative, broker or joint venture agreement, as applicable.
- (7) The bidder or proposer must provide verification that it rejected each non-utilized MBE and WBE because the MBE or WBE did not submit the lowest bid or it was not qualified. Such verification shall include a verified statement of the amounts of all bids received from potential or utilized subcontractors, suppliers, manufacturers, manufacturer's representatives, brokers or joint venturers on the contract, whether or not they are MBEs or WBEs. In making such a determination of not being qualified, the bidder or proposer shall be guided by the definition of qualified in section 28-54(42), but evidence of lack of qualification must be based on factors other than solely the amount of the MBE's or WBE's bid. For each MBE or WBE found not to be qualified by the bidder or proposer, the verification shall include a statement giving the bidder's or proposer's reasons for its conclusion. A bidder's or proposer's industry standing or group memberships may not be the cause of rejection of an MBE or WBE. A bidder or proposer may not reject an MBE or WBE as being unqualified without sound reasons based on a reasonably thorough investigation and assessment of the MBE's or WBE's capabilities and expertise.
- (8) If requested by a solicited MBE or WBE, the bidder or proposer must make reasonable efforts to assist interested MBEs and WBEs in obtaining bonding, lines of credit, or insurance as required by the city or by the bidder or proposer, provided that the bidder or proposer need not provide financial assistance toward this effort.
- (9) If requested by a solicited MBE or WBE, the bidder or proposer must make reasonable efforts to assist interested MBEs and WBEs in obtaining necessary and competitively priced equipment, supplies, materials, or related assistance or services for performance under the contract, provided that the bidder or proposer need not provide financial assistance toward this effort.
- (10) The bidder or proposer must use the DSBO MBE/WBE directories to identify, recruit, and place MBEs and WBEs.

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**Sec. 28-75. Potential violations during contract performance.**

(c) The following modified good faith requirements shall apply to sections 28-72 and 28-73. In the event that a contractor or consultant must add or replace an MBE or WBE subcontractor, subconsultant, joint venturer, supplier, manufacturer, manufacturer's representative or broker or in the event that a new scope of work is added to the ongoing contract, and the contractor or consultant in such event is in non-compliance with maintenance of the original project goal upon which the contract was awarded, due to failure to utilize additional MBEs or WBEs, the following modified good faith efforts must be completed. Failure of a contractor or consultant to show

good faith efforts as to any one (1) of the following categories shall render its overall good faith efforts showing insufficient; and its contract performance in non-compliance with this division 3.

- (1) Verification in writing to the DSBO of the contractor's or consultant's intention to terminate or replace an MBE or WBE originally identified for participation in the bid, proposal or competitive selection process proposal upon which the contract was awarded. The reason for the termination or replacement must be stated and the type of work or services must be identified.
- (2) Verification that the contractor or consultant used the most current MBE and WBE directory from the DSBO in order to contact MBEs and WBEs that are certified in the applicable area of work or supply at the time of the modified good faith effort.
- (3) Verification of efforts to contact appropriate MBEs and WBEs within the same identified subcontractor, subconsultant, joint venturer, supplier, manufacturer, manufacturer's representative or broker area must be documented. Facsimile transmission, e-mail and telephone communication will be acceptable. The director may verify such contacts as he deems appropriate.
- (4) Documentation of the modified good faith efforts must be submitted to the DSBO prior to the payment to the contractor or consultant of the next progress or other partial payment or fund release under the contract.



**EXHIBIT L**  
**CERTIFICATE OF INSURANCE**

**DIA Data Center**  
**Contract Number 201310374**

**June 2013**

**DEPARTMENT OF AVIATION**  
**City & County of Denver**



**AIRPORT INFRASTRUCTURE MANAGEMENT**

**CITY AND COUNTY OF DENVER  
CERTIFICATE OF INSURANCE FOR DEPARTMENT OF AVIATION**

☒ Original COI

☐ Advice of Renewal

☐ Change

Party to Whom this Certificate is Issued:

Name and Address of Insured:

CITY AND COUNTY OF DENVER  
Attn: Risk Management, Suite 8810  
Manager of Aviation  
Denver International Airport  
8500 Peña Boulevard, Room 8810  
Denver CO 80249

**CONTRACT NAME & NUMBER TO WHICH THIS INSURANCE APPLIES: -Data Center – Non OCIP Insurance Requirements**

**Professional Liability, Design, Engineering and Construction Supervision**

**Coverage: Professional Liability**

**Minimum Limits of Liability (In Thousands)**

**Per Claim**

**\$2,000**

**Any Policy issued under this section must contain, include or provide for the following:**

1. Coverage must extend, by endorsement or otherwise, to cover the full scope of any and all environmental work performed under the insured's contract with the City.
2. Coverage shall extend to cover the full scope of all cost estimating work performed under the insured's contract with the City.
3. Coverage shall apply for three (3) years after project is complete.
4. Coverage is to be on a primary basis, if other professional coverage is carried.

**III. ADDITIONAL CONDITIONS**

It is understood and agreed, for the benefit of the City, that the following additional conditions shall apply to all coverage specified herein

- All coverages provided herein shall be primary and any insurance maintained by the City shall be considered excess.
- With the exception of professional liability and auto liability, a Waiver of Subrogation and Rights of Recovery against the City, its officers, officials and employees is required for each coverage period.
- The City shall have the right to verify or confirm, at any time, all coverage, information or representations contained herein, and the insured and its undersigned agent shall promptly and fully cooperate in any such audit the City may elect to undertake.
- Advice of renewal is required.
- All insurance companies issuing policies hereunder must carry at least an A -VI rating from A.M. Best Company or obtain a written waiver of this requirement from the City's Risk Administrator.
- Compliance with coverage requirement by equivalent herein must be approved in writing by the City's Risk Administrator prior to contract execution.
- No changes, modifications or interlineations on this Certificate of Insurance shall be allowed without the review and approval of the Risk Administrator prior to contract execution.

**NOTICE OF CANCELLATION**

It is understood and agreed that should any Policy issued hereunder be cancelled or non-renewed before the expiration date thereof, or sustain a material change in coverage adverse to the City, the issuing company or its authorized Agent shall give notice to the Department of Aviation in accordance with policy provisions.

# **EXHIBIT O**

## **OWNER CONTROLLED INSURANCE PROGRAM (OCIP)**

**DIA Data Center**

**Contract Number 201310374**

**June 2013**

**DEPARTMENT OF AVIATION  
City & County of Denver**



**DENVER INTERNATIONAL AIRPORT**

**AIRPORT INFRASTRUCTURE MANAGEMENT**

## EXHIBIT O

### OWNER CONTROLLED INSURANCE PROGRAM (OCIP)

#### 1.0 Definitions

Drafting Note: OCIP insurance provisions may be placed as an article in the agreement or as an exhibit. Either way, definitions should be included, either in the definitions section of the overall agreement, or within the section pertaining to OCIP. If the definitions are within the insurance section, they should be identified as, in case of conflict with other sections, pertaining to this section only. Definitions should be consistent with what goes into the OCIP manual for contractors and subcontractors.

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Certificate of Insurance:</b>                  | Evidence of the insurance coverage afforded under the OCIP. Also, evidence of insurance coverage provided by Enrolled Parties for automobile liability and offsite exposures.                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Contract:</b>                                  | The written agreement between the City and Contractor describing the Work, Contract Terms and Conditions, or a portion thereof. Also includes a written agreement between a Contractor and any tier of subcontractor.                                                                                                                                                                                                                                                                                                                                                          |
| <b>Contractor:</b>                                | Prime Contractor, subcontractors of any tier.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Contractor insurance cost</b>                  | The Costs of OCIP Coverage is defined as the amount of Contractor's and eligible Subcontractors' of every tier reduction in insurance costs due to the OCIP Program.                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>City (Sponsor):</b>                            | City of Denver                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Owner Controlled Insurance Program (OCIP):</b> | A coordinated insurance program providing certain coverage, as defined herein, for the City, Contractor and Enrolled Subcontractors, along with their Eligible Employees, performing Work at the Project Site.                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Eligible Employees:</b>                        | Employees of Enrolled Subcontractors who are not excluded from the OCIP under the "Excluded Parties" definition.                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Enrolled Parties:</b>                          | The Contractor and those Subcontractors that have submitted all necessary enrollment information and been accepted into the OCIP as evidenced by the issuance of a Certificate of Insurance.                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Excluded Parties:</b>                          | <p>Parties not covered by the OCIP because of ineligibility. No insurance coverage provided by City under the OCIP shall extend to the activities or products of the following:</p> <ol style="list-style-type: none"><li>(1) Any person or organization that fabricates or manufactures products, materials or supplies away from the Project Site(s);</li><li>(2) Hazardous materials remediation, removal, or transportation companies and their consultants;</li><li>(3) Any architect, engineer or surveyor and their consultants except when approved by City;</li></ol> |

- (4) Truckers, haulers, material dealers, vendors, suppliers, and others who merely transport, pick up, deliver or carry materials, personnel, parts or equipment or any other items or persons to or from the Site;
- (5) Contractors and their subcontractors and subconsultants and any employee of an Enrolled Party, who does not work at the Project Site;
- (6) Any employees of an Enrolled Party who occasionally visits the Project Site to make deliveries, pick-up supplies or personnel, to perform supervisory or progress inspections, or for any other reason;
- (7) Persons or entities who are not enrolled parties or included as insureds within the policies;
- (8) Any Day Labor Employees (labor service employees whose coverage is provided by their employer); or
- (9) Any other person or entity specifically excluded by City, in its sole discretion, from participation as Enrolled Parties.

|                                         |                                                                                                                                                                                                                                                                                                                                                             |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Insured:</b><br>(liability policies) | The City, Contractor and Enrolled Parties and their Eligible Employees and any other party named in the insurance policies.                                                                                                                                                                                                                                 |
| <b>Insurers</b>                         | Those Insurance Companies providing the OCIP insurance coverage. The Insurers will be identified in the OCIP Manual.                                                                                                                                                                                                                                        |
| <b>Net Bid:</b>                         | Contractor bids with insurance costs removed because of the obligation of any Enrolled Party to delete insurance costs for coverage provided by the OCIP from its bid and all change orders. Net bids are subject to verification by the OCIP Administrator through the providing of contractors' rate and declaration pages from their Insurance policies. |
| <b>OCIP Administrator:</b>              | Insurance services firm selected by the City to administer the OCIP and provide insurance brokerage services as required.                                                                                                                                                                                                                                   |
| <b>OCIP Manual</b>                      | A reference document provided to contractors of all tiers, which summarizes the terms and provisions of the OCIP and provides information about compliance with OCIP                                                                                                                                                                                        |

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                       | requirements.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Off-Site Work</b>  | Work performed away from the Project Site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Payroll:</b>       | For purposes of the OCIP only, refers to Unburdened Straight Time Payroll per Workers Compensation Class Code.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Project:</b>       | The Project as defined in the contract documents and as described in the Declarations of the OCIP policies.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Project Site:</b>  | Those areas designated in writing by The City of Denver in a Contract document for performance of the Work and such additional areas as may be designated in writing by The City of Denver for Contractor's use in performance of the Work. Subject to OCIP Insurers written approval, the term "Project Site" shall also include: (1) field office sites, (2) property used for bonded storage of material for the Project approved by The City of Denver, (3) staging areas dedicated to the Project, and (4) areas where activities incidental to the Project are being performed by Contractor or Subcontractors covered by the worker's compensation policy included in the OCIP, but excluding any permanent locations of Contractor or such covered Subcontractors. |
| <b>Subcontract:</b>   | The written agreement between Contractor and Subcontractor, or between Subcontractor and a lower tier Subcontractor, describing the Work, Subcontract Terms and Conditions, or a portion thereof.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Subcontractor:</b> | Includes those persons, firms, joint venture entities, corporations, or other parties that enter into a Subcontract with Contractor to perform Work at the Project Site and any of these Subcontractor's lower-tier subcontractors.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Work:</b>          | Operations, as fully described in the Contract and Subcontract, performed at the Project Site.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

## 2.0 General Information

- 2.1 **Insurance Provided by City.** City has arranged for this Project to be insured under an OCIP. Coverage shall be provided for Workers' Compensation, Employer's Liability, General Liability, Excess Liability, Builders Risk (if applicable) and Contractors Pollution Liability as outlined herein and as defined by the respective policies for each coverage, for the period from the start of Work through completion and final acceptance by City, except as otherwise provided herein.

- 2.2 **Enrollment Required.** Parties performing labor or services at the Project site are eligible to enroll in the OCIP, unless they are Excluded Parties (as defined herein). Participation in the OCIP is mandatory but not automatic. Parties eligible for enrollment shall follow the procedures and use the forms provided in the OCIP manual to enroll in the OCIP. When the Contractor and Subcontractors and lower-tier subcontractors are properly enrolled in the OCIP, the OCIP Administrator will issue or have issued to the Contractor, Subcontractor and lower-tier subcontractors, prior to their commencing Work on the Project Site, a Certificate of Insurance evidencing the coverage arranged by City.
- 2.4 **Exclusion of Contractor/Subcontractor Insurance Costs from Proposal and Bid Prices.** Contractor shall exclude from Contractor's cost of work, and ensure that each Subcontractor of every tier exclude from their cost of work, normal costs for insurance without an OCIP for those coverages provided under the OCIP. The calculation of these costs will be determined using the forms found in the OCIP Manual. The Costs of OCIP Coverage includes reductions in insurance premiums, all relevant taxes and assessments, markup on insurance premiums, and losses retained through large deductibles or self-insured retentions, or self-funded other programs. Change orders shall also exclude the Cost of OCIP Coverage.
- 2.5 **Insurance Premiums.** City will pay the insurance premiums for the OCIP coverage. The City is responsible for all adjustments to the premiums and will be the sole beneficiary of all dividends, retroactive adjustments, return premiums, and any other monies due through audits or otherwise. The Contractor assigns to the City the right to receive all such adjustments, and will require that each subcontractor of every tier assign to City all such adjustments. The Contractor and the Subcontractors who are Enrolled Parties shall execute such further documentation as may be required by City to accomplish this assignment.
- 2.6 **Off Site Operations.** The OCIP will provide certain insurance coverage for the City, Contractor and Enrolled Parties, along with their Eligible Employees performing Work at the Project Site. Off-site operations shall be covered only if designated in writing by the City and when all operations at such site are identified and solely dedicated to the Project. Contractors and Subcontractors are responsible to notify the OCIP Administrator in writing, to request coverage for specified off-site operations. Coverage is not provided at the site unless confirmed in writing by the OCIP Administrator.
- 2.7 **OCIP Manual.** As soon as practicable, an OCIP Manual will be sent to the Enrolled Party and will become a part of the Contract and Contractor's Subcontract with Subcontractor. The OCIP Manual will contain the administrative and claim reporting procedures. Contractor agrees to and will require that its Subcontractors and their lower-tier subcontractors also cooperate with the OCIP Administrator in providing all information as required in the OCIP Manual.

- 2.8 **Conflicts.** The descriptions of the OCIP Coverages set forth in this Section are not intended to be complete or meant to alter or amend any provision of the actual OCIP Policies. The OCIP coverages and exclusions are set forth in full in their respective policy forms. In the event of a conflict or omission between the coverages described in the OCIP Policies and the coverages summarized or described in the OCIP Manual, this Section or elsewhere in the Contract Documents, the coverages and coverage amounts set forth in the actual OCIP Policies issued by the OCIP Insurers shall control. In the event of a conflict between the provisions of this Section and the OCIP Manual that does not involve any conflict with the provisions of the actual OCIP Policies issued by the OCIP Insurers, then the provisions of this Section shall govern.

### 3.0 Summary of Insurance Coverage

- 3.1 **Insurance Provided by the City.** Unless otherwise provided herein, prior to commencement of the Work, City, at its sole option and expense, shall secure and maintain at all times during the performance of this Contract the insurance specified below, insuring the City, Contractor, its Subcontractors and such other persons or interests as City may designate with limits not less than those specified below for each coverage.

#### **Workers' Compensation & Employer's Liability:**

**Coverage:** Statutory limits required by the Workers' Compensation Laws of the State of Colorado:

|                  |                            |             |               |
|------------------|----------------------------|-------------|---------------|
| <b>Part One:</b> | Workers' Compensation:     | Statutory   | Limits        |
| <b>Part Two:</b> | Employer's Liability:      |             |               |
|                  | Bodily Injury by Accident: | \$2,000,000 | each accident |
|                  | Bodily Injury by Disease:  | \$2,000,000 | each employee |
|                  | Bodily Injury by Disease:  | \$2,000,000 | policy limit  |

#### **General Liability** (excluding Automobile Liability and Professional Liability):

**Coverage:** Third party personal injury, bodily injury and property damage liability

#### **Limits of Liability:**

|                    |                                       |              |
|--------------------|---------------------------------------|--------------|
|                    | Each Occurrence Limit                 | \$ 2,000,000 |
|                    | General Aggregate                     | \$ 4,000,000 |
| Products/Completed | Operations Aggregate                  | \$ 4,000,000 |
|                    | Personal/Advertising Injury Aggregate | \$ 2,000,000 |

Above limits are shared for all Roadway Projects/Contracts.



**Excess/Umbrella Liability Insurance (limits noted are minimum limits. The City may elect to provide higher limits, based on the size of the Project):**

**Coverage:** Written on a following form basis over the primary policies.

**Minimum Limits of Liability:**

|                                         |                      |
|-----------------------------------------|----------------------|
| Each Occurrence                         | \$50,000,000 or more |
| General Aggregate                       | \$50,000,000 or more |
| Products/Completed Operations Aggregate | \$50,000,000 or more |

Products/Completed Operations coverage will extend to the statute of limitations.

Excess Limits above the first \$50,000,000 may apply to all Projects placed under the City's OCIP. .

**General Liability Insurance Claim Chargeback.** A claims charge-back will be assessed for the amount of any loss payable under the OCIP Commercial General Liability Policy. The Enrolled Party primarily responsible for causing any bodily injury or property damage liability loss shall be responsible for payment of the charge-back. The charge-back will be calculated on the following sliding scale:

For each Contract Per Occurrence:

|                                                                            |
|----------------------------------------------------------------------------|
| \$1,000 for Enrolled Party with contracts up to \$100,000                  |
| \$5,000 for Enrolled Party with contracts between \$100,001 and \$250,000  |
| \$10,000 for Enrolled Party with contracts between \$250,001 and \$500,000 |
| \$25,000 for Enrolled Party with contracts over \$500,000                  |

**Contractors Pollution Liability Insurance (limits noted are minimum limits. The City may elect to provide higher limits, based on the size of the Project):**

Unless other provided, the City shall purchase Contractors Pollution Liability arising from claims for pollution incidents arising from Work or services performed under contract at or from the designed Project Site.

**Coverage:** Liability or responsibility for unexpected and unintended pollution conditions resulting in bodily injury, property damage or environmental damage from pollution conditions caused by covered operations including completed operations. Coverage includes microbial matter and legionella pneumophila in any structure on land and the atmosphere contained with the structure.

**Limits of Liability:**

|            |                      |
|------------|----------------------|
| Each Loss: | \$10,000,000 or more |
|------------|----------------------|

Policy

Aggregate:

\$10,000,000 or more

Products/Completed Operations coverage may extend for a minimum of eight (8) years after final completion of the Project.

**Contractors Pollution Insurance Claims Chargeback.** A claims chargeback will be assessed for the amount of any loss payable under the Contractors Pollution. Up to the first \$5,000 of any loss will be paid by Contractor. This includes all expenses or claim payments incurred by the OCIP Insurer for losses attributable to the Contractor's work, acts or omissions, or the work, acts or omissions of any tier of subcontractor. Contractor may elect to pass this charge through to any responsible subcontractor but in no event may require total subcontractor reimbursement in excess of \$5,000.

**Builder's Risk Insurance (if required)**

Unless otherwise provided, the City shall purchase and maintain, builder's risk (and/or Installation Floater) in the amount of the initial Contract Sum, plus value of subsequent Contract modifications and cost of materials supplied or installed by others, comprising total value for the entire Project at the site on a replacement cost basis (as defined in the builders' risk policy). Such builders risk insurance shall end when the first of the following occurs: 1) the City's interest in the Work ceases; 2) the policy expires or is cancelled; or 3) the Work is accepted by the City.

Builders' risk insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss of damage including , theft, vandalism, malicious mischief, terrorism, rigging and hoisting for materials and equipment that are part of the Project, collapse, earthquake, flood, windstorm, falsework, testing and startup (as provided by the policy), temporary buildings and debris removal including demolition occasioned by enforcement of any applicable ordinance laws, and shall cover reasonable compensation for services and expenses required as a result of such insured loss.

This builder's risk insurance shall cover portion of the Work stored off site, and also portions of the Work in transit.

The City and Contractor shall waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents and employees, each of the other, and (2) the Architect, Architect's consultants, separate contractors, if any, and any of their subcontractors, sub-subcontractors, agents and employees, for damages caused by fire or other causes of loss to the extent covered by builders risk insurance obtained pursuant to this section or other property insurance applicable to the Work, except such rights as they have to proceeds of such insurance held by the City as fiduciary. The City or

Contractor, as appropriate, shall require of the Architect, Architect's consultants, separate contractors, and their subcontractors, sub-subcontractors, agents and employees of any of them, by appropriate agreements, written where legally required for validity, similar waivers each in favor of other parties enumerated herein. The policies shall provide such waivers of subrogation by endorsement or otherwise. A waiver of subrogation shall be effective as to a person or entity even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, did not pay the insurance premium directly or indirectly, and whether or not the person or entity had an insurable interest in the property damaged.

**Builder's Risk Insurance Claims Chargeback.** A claims charge-back will be assessed for the amount of any loss payable under the Builder's Risk Policy. Up to the first \$5,000 of any loss will be paid by Contractor. This includes all expenses or claim payments incurred by the OCIP Insurer for losses attributable to the Contractor's work, acts or omissions, or the work, acts or omissions of any tier of subcontractor. Contractor may elect to pass this charge through to any responsible subcontractor but in no event may require total subcontractor reimbursement in excess of \$5,000.

- 3.2 **Insurance provided by Enrolled Parties.** At their own expense, the Enrolled Parties of all tiers must carry the following minimum coverage and limits:

**Commercial Automobile Liability Insurance** for contract work both occurring on-site and off-site with limits of liability not less than:

\$2,000,000 Combined Single Limit

This insurance must apply to all owned, leased, non-owned or hired vehicles to be used in the performance of work. Such insurance shall allow contractor to waive subrogation against the City and/or its representatives and all Contractors and Subcontractors prior to loss or shall include a waiver of the insurer's right of subrogation. Contractor hereby waives rights of subrogation against City and/or its representatives and all Contractors and Subcontractors. **If operations include unescorted airside access at DIA, then a \$9 million Umbrella Limit is required.**

**Off-Site Workers' Compensation Insurance**, including Employer's Liability with minimum limits of

\$1,000,000 Bodily Injury with Accident – Each Accident

\$1,000,000 Bodily Injury with Disease – Policy Limit

\$1,000,000 Bodily Injury with Disease – Each Employee

Coverage to protect Contractor/Subcontractor from and against all claims arising from performance of Work outside the Project Site under the Contract.

Such insurance (where permissible by law) shall waive subrogation against the City and/or its representatives and all Contractors and Subcontractors

**Off-Site Commercial General Liability Insurance** for Contract operations not physically occurring within the Project Site with a limit of liability not less than:

Primary Insurance

|             |                                         |
|-------------|-----------------------------------------|
| \$1,000,000 | Each Occurrence                         |
| \$1,000,000 | Personal Injury and Advertising Injury  |
| \$2,000,000 | General Aggregate                       |
| \$2,000,000 | Products/Completed Operations Aggregate |

Such policy shall include coverage for contractual liability assumed under the Contract, contractors' protective liability, and explosion, collapse and underground property damage hazards. The Policy Form should be CG 00 01 or equivalent. Contractor and Subcontractors of all tiers will be required to provide additional Insured status to the City for general liability policies in the name of:

CITY AND COUNTY OF DENVER AND THE DEPARTMENT OF AVIATION, AND MEMBERS OF THE BOARD OF SUPERVISORS OF THE CITY AND COUNTY OF DENVER AND THE DEPARTMENT OF AVIATION, AND THE OFFICERS, AGENTS AND EMPLOYEES OF THE CITY AND COUNTY OF DENVER AND THE DEPARTMENT OF AVIATION, INDIVIDUALLY AND COLLECTIVELY, AS ADDITIONAL INSURED

The additional Insured status shall provide coverage for the Premises/Operations and Products/Completed Operations exposures and shall indicate that such coverage is primary to any insurance carried by the City.

**3.2.1 Insurance provided by Enrolled Parties for Special Situations.** The Contractor or Subcontractor of any tier, at its own expense, shall provide and maintain the following insurance of the type and in limits as set forth by City risk management should construction operations warrant such coverage.

**Aircraft/Aviation Liability.** Should aircraft of any kind be used by the Contractor, or by anyone else on its behalf, the Contractor shall contact City risk management to ensure the appropriate aircraft/aviation liability is in place. All limits, coverages, and endorsements will be set and enforced by City risk management.

**3.3 Insurance Requirements for Excluded Parties.** Contractor and each Subcontractor and its lower-tier subcontractors shall require all Excluded Parties, as defined herein, to provide and maintain insurance of the type and in

limits as set forth in the Contractor Subcontract Agreement. The OCIP, OCIP Policies, and OCIP Coverage shall not apply to Excluded Parties, even if erroneously enrolled in the OCIP. Excluded Parties and parties no longer enrolled or covered by the OCIP or erroneously enrolled in the OCIP shall obtain and maintain, and require by contract that each of their lower-tier Subcontractors obtain and maintain at a minimum, the insurance coverage required by Section 3.2 above, and as required by the OCIP Manual.

#### **4.0 Contractor Warranties and Agreements**

- 4.1 **Accuracy of Contractor-provided Information.** Contractor warrants that all information submitted to the City or the OCIP Administrator is accurate and complete to the best of its knowledge. Contractor will notify the City or Administrator immediately in writing of any errors discovered during the performance of the work.
- 4.2 **Contractor Responsible To Review Coverage.** Contractor acknowledges that all references to OCIP policy terms, conditions, and limits of liability in this document, as well as the OCIP Manual, are for reference only. Contractor and its subcontractors are responsible for conducting their own independent review and analysis of the OCIP coverage in formulating any opinion or belief as to the applicability to such coverage in the event of any loss or potential claim. Any type of insurance or increase of limits not described above which the Contractor requires for its own protection or on account of statute shall be its own responsibility and at its own expense.
- 4.3 **Audit.** Contractor agrees to make its records available for review and to cooperate with the insurers, the City, the Auditor of the City, and the representatives of the aforesaid parties in the event of an audit. In the event that a City audit of Contractor's records, as permitted in the Contract or other OCIP documents, reveals a discrepancy in the insurance, payroll, safety, or any other information required to be provided to City or OCIP Administrator, or reveals inclusion of costs for OCIP coverage in any payment for the work, City will have the right to deduct from payments due Contractor all such insurance costs as well as all audit costs.
- 4.4 **Insurance Costs Removed.** Contractor warrants that the Costs for insurance as provided under the OCIP were not included in Contractor's bid or proposal for the Work, the Contract Price/Contract Sum, and will not be included in any change order or any request for payment for the Work or extra work.

#### **5.0 Contractor Obligations**

- 5.1 **OCIP Documents shall be provided to Subcontractors.** Contractor shall furnish each bidding Subcontractor, vendor, supplier, material dealer or other party a copy of this OCIP Exhibit and the OCIP Manual and shall incorporate the terms of this Exhibit in all contracts and agreements entered into for performance of any portion of the Work.

- 5.2 **Timely Enrollment Required.** Contractor shall enroll in the OCIP within five (5) days request by City or its OCIP Administrator. Contractor shall notify each Subcontractor of the procedure for enrolling in City's OCIP and confirm that enrollment is mandatory but not automatic. Contractor shall assure that Subcontractor and its lower-tier subcontractors shall not commence work until verification of enrollment is confirmed by the OCIP Administrator by the issuance of a Certificate of Insurance.
- 5.3 **Compliance with Conditions.** Contractor shall not violate any condition of the policies of insurance provided by City under the terms of this OCIP Exhibit or the OCIP Manual. All requirements imposed by the subject policies and to be performed by Contractor shall likewise be imposed on, assumed, and performed by each Subcontractor and their lower-tier subcontractors.
- 5.4 **Claims Cooperation.** Contractor shall participate in the claim reporting procedures of City's OCIP. Contractor agrees to assist and cooperate in every manner possible in connection with the adjustment of all claims arising out of operations within the scope of the Work required by the Contract, and to cooperate with the Insurer in all claims and demands which City's Insurer(s) is called upon to adjust or to defend against. Contractor shall take all necessary action to assure that its Subcontractors and their lower-tier subcontractors comply with any such request for assistance and cooperation. This obligation includes, without limitation, providing light or modified duty for injured workers, appearing in mediation, arbitration or court proceedings and/or participating in settlement meetings, as may be required.
- 5.5 **Monthly Payroll Submission.** All Enrolled Parties shall submit monthly payrolls and worker-hour reports to City or OCIP Administrator on the form required in the OCIP manual. This reporting form will be provided to all Contractors at time of enrollment into the OCIP. Failure to submit these reports may result in funds being held or delayed from monthly progress payments. The form must be submitted for each month, including zero (0) payroll, if applicable, until completion of the Work under each Contract and Subcontract. For those Subcontractors and lower-tier subcontractors performing Work under multiple Subcontracts, a separate form is required for each Subcontract under which Work is being performed.
- 5.6 **Response to Information Requests.** All insurance underwriting, payroll, rating or loss history information requested by City or the OCIP Administrator shall be provided by the Contractor within three (3) business days of the request. Contractor agrees (and will require each Subcontractor to agree) that City, City's insurer or City's representative may audit the Contractor's or Subcontractor's records and the records of lower-tier subcontractors to confirm the accuracy of all insurance information provided, including, without limitation, any such information that may have any effect on insurance resulting from changes in the Work. At all times during performance of the Contract and Subcontracts, the Contractor, Subcontractor and lower-tier

subcontractors shall cooperate with City, OCIP Administrator and OCIP insurers.

**5.7 Responsibility for Safety.** Notwithstanding the OCIP, the Contractor shall initiate, maintain and supervise all safety precautions and programs in connection with the Work. Contractor is solely responsible, at no adjustment to the contract sum payable or contract time, for initiating, maintaining, and supervising all safety precautions and programs relating to the conduct of Work, including, without limitation, any safety programs or procedures that are required by any applicable state or federal laws, rules or regulations, or by the terms of the OCIP Manual.

**5.8 Duty of Care.** Nothing herein shall relieve the Enrolled Parties of their respective obligations to exercise due care in the performance of their duties in connection with the Work or to complete the Work in strict compliance with this Contract and subsequent subcontracts.

## **6.0 Notices, Costs**

**6.1 Limitations on City Provided Coverage.** City assumes no obligations to provide insurance other than that evidenced by the policies referred to in Paragraph 3.1 and subparagraphs. City, however, reserves the right to furnish insurance coverage of various types and limits provided that such coverage shall not be less than that specified in Paragraph 3.1 and the costs of such insurance shall be paid by City. The OCIP also does not cover Workers' Compensation claims or Commercial General Liability claims arising from "Off-Site Work."

**6.2 Contractors Responsible for Own Equipment.** Contractors' Equipment insurance for all construction tools and equipment whether owned, leased, rented, borrowed or used on work at the Project Site is the responsibility of the Contractor and/or Subcontractor, and the City shall not be responsible for any loss or damage to tools and equipment. This Contractors' Equipment insurance shall contain a waiver of subrogation against City and/or its representatives and all approved Contractors and Subcontractors. If an individual Enrolled Party does not purchase such insurance, that Enrolled Party will hold harmless City and/or its representatives and other Enrolled Parties for damage to tools and equipment.

**6.3 No Release; No Waiver of Immunity.** The provision of the OCIP shall in no way be interpreted as relieving CM or any Subcontractor of any responsibility or liability under the Contract Documents, the OCIP Policies, or Applicable Laws, including, without limitation, Contractor's and Subcontractor's responsibilities relative to indemnification and their obligation to exercise due care in the performance of the Work and to complete the Work in strict compliance with the Contract Documents. The parties hereto understand and agree that the City, its officers, officials and employees, are relying on, and do not waive or intend to waive by any provisions of this agreement, the

monetary limitations or any other rights, immunities and protections provided by the Colorado Governmental Immunity Act, §§ 24-10-101 to 120, C.R.S., or otherwise available to the City, its officers, officials and employees.

- 6.4 **City Right to Withhold Payments.** In addition to any other rights of withholding that City may have under the Contract Documents, City has the right to withhold any payments otherwise due to Contractor in the event of a failure by Contractor or any Subcontractor to comply with the requirements of this Exhibit or the OCIP Manual. City may withhold from any payment owing to Contractor the Costs of OCIP Coverage if included in a request for payment. Such withholding by City shall not be deemed to be a default under the Construction Contract. City shall withhold from Contractor the Costs of OCIP Coverage attributable to an increase in an Enrolled Party's total payroll for the Work over the amount reported to City and OCIP Administrator at time of enrollment in the OCIP.
- 6.5 **City Remedies.** Without limitation upon any of City's other rights or remedies, any failure of an Enrolled Party to comply with any provision of this Exhibit or the OCIP Manual shall be deemed a material breach of the Construction Contract, thereby entitling City, at its option, upon notice to Contractor, to suspend performance by Contractor, without any adjustment to Contract Sum Payable or Contract Time, until there is full compliance, or (2) or terminate this Construction Contract for cause.
- 6.6 **Off-Site Storage.** Unless otherwise provided in the Contract Documents, the property insurance provided by the City shall not cover portions of the Work stored off the Site without written approval of the City. Contractor shall be responsible for reporting such property or work if ownership has been transferred to the City. If ownership rests with the Contractor, Contractor shall be responsible for obtaining insurance to protect its interests.
- 6.7 **Partial Occupancy.** Partial occupancy or use shall not commence until the insurance company or companies providing builder's risk and/or property insurance have consented to such partial occupancy or use by endorsement or otherwise. The City and the Contractor shall take reasonable steps to obtain consent of the insurance company or companies and shall, without mutual written consent, take no action with respect to partial occupancy or use that would cause cancellation, lapse or reduction of insurance.
- 6.8 **City Right to Exclude Parties from OCIP.** City reserves the right to exclude any Subcontractor from the OCIP, before or after enrollment by the Subcontractor into the OCIP. If City elects to exclude a Subcontractor from the OCIP, the Contractor will be responsible for ensuring the insurance coverage outlined in the Contractor's Subcontract Agreement are provided to the City or OCIP Administrator before the Subcontractor can begin or resume work on the Project.
- 6.9 **City's Right to Modify or Discontinue OCIP Coverages.** The City may, for



any reason, modify the OCIP Coverages, discontinue the OCIP, not bind the OCIP Coverages, or request that Contractor or any Subcontractor withdraw from the OCIP upon thirty (30) Days' written notice. The Contractor and the Subcontractors shall in such an event secure and maintain such insurance as is required to provide replacement coverage comparable to that provided under the OCIP. Provided that the foregoing is not the result of any failure by the Contractor or any Subcontractor to comply with the requirements of the Contract Documents or OCIP Reference Guide, the costs of such replacement insurance shall be deemed a Cost of Work for which the Contractor shall be entitled to a Contract Adjustment, without any sum added thereto for Allowable Markup. The form, content, limits of liability, cost and the rating of the insurer issuing such replacement insurance shall be subject to the City's prior written approval.

- 6.10 **City Right to Purchase Other Coverages.** The City reserves the right at its option, and without obligation to do so, to furnish other insurance coverage of various types and limits if such coverage is not less than that specified in the Contract Documents to be provided by the City. Apart from the OCIP Coverages, the City may at its option purchase additional insurance coverages that insure the Project that may not necessarily insure the Contractor or the Subcontractors. Without limitation, examples of such coverage may include pollution liability, excess professional liability, and excess automobile liability insurance.

# CITY AND COUNTY OF DENVER, DEPARTMENT OF AVIATION



## OWNER CONTROLLED INSURANCE PROGRAM SAFETY MANUAL

SEPTEMBER 18, 2012

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## ***SECTION 1. INTRODUCTION & GENERAL INFORMATION***

---

The City and County of Denver has arranged for this construction project to be insured under the Owner Controlled Insurance Program (OCIP). An OCIP is a single insurance program that insures the City and County of Denver, the CMGC and Subcontractors of any tier, and other designated parties for work performed at the project site. Certain Trade Contractors and Subcontractors are ineligible for this program. See OCIP Insurance Manual for eligibility.

The OCIP Safety Manual was prepared by The City and County of Denver, Parsons, and Arthur J. Gallagher & Co. to ensure pro-active safety processes are used on this project to prevent incidents and injuries to all employees and the public. The Contractor and Subcontractors are responsible for complying fully with all applicable laws, statutes, ordinances, rules, regulations and/or orders of any public authority (federal, state, local) as they relate to safety of persons, environment, public, or property. This document is not an attempt to reiterate applicable health and safety standards. Changes in these standards made during the duration of your contract will be immediately binding and enforced, provided they are more stringent than existing health and safety standards. All applicable OSHA, ANSI, NEC, and NFPA standards are incorporated into this program by reference. The Contractor and Subcontractors shall maintain a current copy of the OSHA Construction standards on the site.

Throughout the duration of this project, the Contractor and Subcontractor shall be responsible for administering their own safety program. Neither this document, nor the safety services provided by individuals associated with this project, is intended to serve as a substitute for the control and responsibility of the Contractor and Subcontractor to provide a safe work environment for their employees, students, faculty, staff and the public.

All safety programs will be submitted for review and acceptance prior to the start of any construction activities. The safety programs submitted must meet or exceed the safety requirements outlined in Division 1, the OCIP Safety Manual and be in compliance with all applicable federal, state, and local safety and environmental laws and regulations. This OCIP Safety Manual shall serve as a general framework. The contractor will be required to develop a site specific safety plan, which identifies specific site safety requirements, potential exposures associated with the project, and the means and methods to be employed to address these exposures. The site specific safety plan shall be submitted and accepted before the contractor initiates work under the scope of their contract. Review and acceptance of the Contractor's site specific safety plan shall not impose any liability on the Owner and Owner's Representatives. All Subcontractors will be required to develop their own site specific safety plan. Subcontractors must submit their site specific safety plan to the Contractor. The Contractor is responsible for reviewing their Subcontractor's site specific safety plan and making them available to the OCIP Safety Team for review.

The Contractor will be responsible for overseeing the safety of all Subcontractor employees on the project. This is required regardless of a Subcontractors' eligibility for coverage under the OCIP program; however, this does not relieve the subcontractor of its safety responsibilities.

The OCIP has specific safety requirements that in many instances exceed current federal, state, or local safety and environmental standards. In the event of a conflict between Division 1 and the OCIP Safety Manual, the Program Safety Manager and the Director of Construction have the final say as to which safety procedures are to be followed.

Therefore, the Contractor and Subcontractors shall thoroughly review this document and the appropriate portions of the Contract Documents (Division 1- General Requirements) to understand the risks inherent in the project and the safety measures needed to adequately protect employees and the public from harm. No accommodations will be made to Contractors and Subcontractors due to ignorance regarding safety program requirements. The cost of compliance shall be borne solely by the Contractor and Subcontractors.

This document shall become part of the Contract Documents. The requirements contained herein are binding and failure to comply will be deemed as non-compliance or default of the contract. Payments of monthly invoices may be withheld until compliance is deemed satisfactory. Failure to comply may result in removal from the project.

**The OWNER and Owner Representatives (Program Manager) reserves the right to make any changes and modifications to this document via bulletin form or any other written communication.**

## SECTION 2. DEFINITIONS

---

A. The following acronyms and titles may not reflect the actual titles and acronyms in use by all entities on this project and do not have any force or effect beyond their use in the Safety Standards. Due to such differences in nomenclature among Owners and Contractors, the following are used throughout the OCIP Safety Manual to establish the functional framework for the OCIP Safety Program.

- 1) **Accident** . An undesired event or sequence of events causing injury, illness, property damage or loss of life.
- 2) **Authorized Person**. (In reference to an employee's assignment) Selected by the employer for that purpose.
- 3) **Denver International Airport (DIA) OCIP Team**. This is the management team that represents the safety and health interests of the OCIP in the prevention of insurable loss on Department of Aviation OCIP projects. The team includes The City and County of Denver project Risk Management and Safety Departments, and Arthur J. Gallagher safety representatives and representatives from the insurance carrier.
- 4) **Competent Person**. One who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
- 5) **Contractor**. The entity with which the Owner enters into this contract.
- 6) **Contractor Safety Representative**. Fulltime safety professional assigned to monitor the safety of contractor employees and subcontractors under the scope of work of the contract.
- 7) **Employee**. Person employed by an Employer as defined by this section.
- 8) **Employer**. Firm or entity that has Employees working on site and is enrolled in the OCIP program. The term Employer includes the Contractor and Subcontractors of all tiers.
- 9) **Hole**. A gap or void 2 inches or more in its least dimension, in a floor, roof, or other walking/working surface.
- 10) **Near Miss Incident**. Incident that had the potential to cause harm or injury but because of circumstances resulted in no harm.
- 11) **OCIP Broker/Administrator**. Arthur J. Gallagher & Co. (AJG) is the broker administering the OCIP Insurance Program providing risk management consulting and being a consultant for safety to the project.
- 12) **OCIP Safety Team**. Arthur J. Gallagher, Insurance Carrier, Denver International Airport Risk Management representative(s) responsible for monitoring, evaluating and coordinating the Contractor's safety, health, and environmental compliance.
- 13) **OSHA**. OSHA as used in the context of these Safety Standards refers to Federal agency with jurisdiction over workplace occupational safety and health at the project site.

- 14) **Owner Controlled Insurance Program (OCIP).** Owner's wrap-up insurance program which provides insurance coverage for eligible and enrolled owner's representatives, Contractors, and Subcontractors of any tier, working on City and County of Denver OCIP project sites. The Owner identifies program participants.
- 15) **Program Manager.** (To be determined....) has been tasked with providing services to include broad Program Management Support Services for the planning, design and construction support.
- 16) **Qualified Person, Attendant or Operator.** A person designated by the employer who by possession of a recognized degree, certificate, or professional standing, or who, by extensive knowledge, training and experience, has successfully demonstrated his/her ability to solve or resolve problems relating to the subject matter, the work, or the project.
- 17) **Site-Specific Safety Program (SSSP).** The Employer's Site-Specific Safety Program prepared in accordance with the requirements of this document and the Contract.
- 18) **Subcontractor.** Firm or other entity awarded work by a Contractor on a particular construction project. Subcontractor as used herein shall apply to all tiers of Subcontractors, as well as vendors and service providers performing work for the benefit of the Contractor. For the purposes of the Safety Standards, vendors, suppliers, and service providers on the project for the furtherance of the project are covered by this definition and are subject to the provisions of the Safety Standards even though they may not be enrolled in the OCIP.
- 19) **Walking and Working Surface.** Any surface, whether horizontal or vertical on which an employee walks or works, including, but not limited to, floors, roofs, ramps, bridges, runways, formwork and concrete reinforcing steel but not including ladders, vehicles, or trailers, on which employees must be located in order to perform their job duties.

### **SECTION 3. DIA OCIP SAFETY TEAM DIRECTORY**

| Name           | Title                   | Company        | Office         | Cell           | Email                                                                              |
|----------------|-------------------------|----------------|----------------|----------------|------------------------------------------------------------------------------------|
| Kate Tremblay  | Risk Manager            | DIA            | (303) 342-2152 | (970) 481-9341 | <a href="mailto:Kate.Tremblay@flydenver.com">Kate.Tremblay@flydenver.com</a>       |
| Keith Williams | Safety Manager          | DIA            | (303) 342-2132 | (303) 513-6233 | <a href="mailto:Keith.Williams@flydenver.com">Keith.Williams@flydenver.com</a>     |
| TBD            | DIA Project Manager     | DIA            |                |                |                                                                                    |
| Rich Cosgrove  | Safety Consultant       | A.J. Gallagher |                | (415) 716-7478 | <a href="mailto:Rich_Cosgrove@ajg.com">Rich_Cosgrove@ajg.com</a>                   |
| Terry McIntire | Safety Consultant       | A.J. Gallagher |                | (925) 407-5451 | <a href="mailto:Terry_McIntire@ajg.com">Terry_McIntire@ajg.com</a>                 |
| Mike Briggs    | Loss Control Consultant | The Hartford   | (602) 674-2718 | (602) 478-6586 | <a href="mailto:Michael.Briggs@thehartford.com">Michael.Briggs@thehartford.com</a> |

Cell Phone numbers are 24/7

**For all emergencies, call 303-342-4211.**

## SECTION 4. SAFETY RESPONSIBILITIES & QUALIFICATIONS

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### 4.0 CONTRACTOR

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- A. Contractor and subcontractors, of any tier, have the explicit responsibility to perform work in accordance with Division 1- General Requirements, federal law (including both 29CFR1910 and 29CFR1926 statutes) and the City and County of Denver's OCIP Safety Manual requirements that may also include any regulations required by the Federal Aviation Administration, Transportation Safety Administration, Homeland Security or United States Customs. This is in addition to compliance with the Contractor's company requirements and approved site specific safety plan (SSSP).

### 4.1 CONTRACTOR SAFETY REPRESENTATIVE

---

- A. The Contractor shall assign a fulltime safety professional to monitor the safety of their employees and subcontractors under the scope of work of the contract. If the manpower loading exceeds 249 employees on the project, a second fulltime safety professional shall be retained. If the project exceeds 750 employees, the Program Manager and Contractor will discuss the need for adding additional safety personnel to ensure the safety expectations of the OCIP are fully met. When multiple shifts are involved the Contractor will assign additional qualified safety professional meeting the minimum qualification outlined below.
- B. The qualifications of the Contractor's safety representative must be submitted to the Program Manager and OCIP Safety Team for review prior to assignment to the site. Approval will depend upon the following qualifications and experience:
  - 1) Hold a BCSP (Board of Certified Safety Professionals) designation (CHST, ASP, CSP) with at least 5 years of relevant construction safety and health experience; or
  - 2) Have a Bachelor's degree in Safety Management or an equivalent engineering degree with at least 7 years of relevant construction safety and health experience; or
  - 3) Have at least 12 years of relevant construction safety and health experience; and
  - 4) Completed the OSHA 500 course for construction within the last 24 months.
  - 5) Provide proof of completion of a Red Cross or approved equal for Cardio – Pulmonary Resuscitation (CPR), First Aid, Automated External Defibrillation (AED), and blood-borne pathogens training course.
  - 6) Completion of drug and alcohol reasonable suspicion training.
  - 7) Knowledge of safety representatives' responsibilities
- C. Specific responsibilities of the Contractor's Safety Representative include, but are not limited to the following:
  - 1) Employee Safety Orientation and Training

- i) Conduct orientation sessions for employees new to the site, prior to their beginning work.
  - ii) Participate in weekly tool box safety meetings; assist field supervisors, as requested, with meetings.
  - iii) Conduct monthly supervisor safety meetings.
  - iv) Participate in Job Hazard Analysis development and Pre-Task Planning activities
  - v) Instruct supervisors on safety rules and regulations
  - vi) Instruct employees concerning special procedures (e.g. lock-out, excavation, confined space entry, FAA, TSA, DHS, etc.) as required by OSHA or this manual
  - vii) Conduct regulatory training as required
  - viii) Conduct emergency evacuation training.
- D. Record Keeping
  - 1) Complete OSHA, state, federal, company and project specific reports.
  - 2) Complete accident investigation, conduct root cause analysis and develop lessons learned reports for distribution to contractors, subcontractors and OCIP Safety Team.
  - 3) Complete inspection reports.
  - 4) Maintain training documentation.
  - 5) Complete and process The City and County of Denver OCIP safety and health reporting requirements, this includes but is not limited to inspections, incident/accident reports and training logs.
- E. Safety Standards, Rules and Regulations Enforcement
  - 1) Authority to stop work.
  - 2) Organizational freedom necessary to implement and enforce subcontractor safety and health programs.
  - 3) Authority to take immediate corrective action.
  - 4) Implement, maintain, and update, as required, conditions and project site specific safety policies and procedures.
  - 5) Interpret and implement site specific safety policies and procedures.
  - 6) Demonstrate, by example, proper safety behavior.
- F. First Aid/Medical Treatment
  - 1) Ensure first aid supplies are adequate.
  - 2) Investigate accidents and complete or obtain accident reports.
  - 3) Coordinate transportation of employees with minor injuries to contractor's first aid station or designated medical facility.
- G. General Responsibilities
 

Keep the OCIP Safety Team apprised of any safety related problems that have or may develop.

  - 1) Conduct work area safety inspections and forward results to the OCIP Safety Team.
  - 2) Conduct investigations of all accidents and incidents and forward reports to the OCIP Safety Team.
  - 3) Compile safety statistical information and copy the OCIP Safety Team.

## 4.2 *SUBCONTRACTOR SAFETY REPRESENTATIVE*

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- A. Subcontractors of any tier are responsible for complying with the safety requirements addressed in the OCIP Safety Manual, the Contractor's SSSP, Federal, State and Environmental, Safety and Health rules and regulations whichever is most stringent.
- B. Each subcontractor on site with a manpower loading less than 50 employees shall have an employee assigned as a safety representative meeting the minimum requirements listed below. This employee may be a working foreman.
  - 1) Completed at least an OSHA 10 Construction Outreach Training Course within the last twenty-four (24) months before being assigned to this project.
  - 2) Provide proof of completion of a Red Cross or approved equal for Cardio – Pulmonary Resuscitation (CPR), First Aid, Automated External Defibrillation (AED), and blood-borne pathogens training course.
  - 3) Received training on Heat Illness and is required by qualification to train his/her employees on the subject.
- C. When a subcontractor's manpower loading is equal to or exceeds 50 employees, the subcontractor is required to have a full time subcontractor safety representative onsite. The qualifications for the full time safety representative shall meet the following minimum requirements:
  - 1) Completed at least an OSHA 30 Construction Outreach Training Course within the last twenty-four (24) months before being assigned to this project.
  - 2) Provide proof of completion of a Red Cross or approved equal for Cardio – Pulmonary Resuscitation (CPR), First Aid, Automated External Defibrillation (AED), and blood-borne pathogens training course.
  - 3) Received training on Heat Illness and is required by qualification to train his/her employees on the subject.
  - 4) Completion of drug and alcohol reasonable suspicion training.
- D. Duties of the Subcontractor Safety Representative include the following regardless of manpower loading:
  - 1) Participation in accident and incident investigation involving their work and employees.
  - 2) Have the right and authority to stop any and all hazardous work being performed by their employer whenever imminent danger to life and health exists.
  - 3) Organizational freedom necessary to implement and enforce subcontractor's safety and health program and report to their own direct supervisor all cases of employees who, in their opinion, are not qualified for the work to which they have been assigned or who engage in unsafe practices.
  - 4) Attend safety meetings scheduled by contractor or OCIP Safety Team.
  - 5) Counsel and train if necessary the employees when the Daily Pre-Task Planning Sheet does not adequately identify the key areas of the task.



### 4.3 *FIELD SUPERVISORS/FOREMAN*

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- A. The field supervisors have the responsibility for overall training, control, and conduct of personnel on their crew. As first line supervisors, their role in the safety and health program is crucial because they set standards by which their employees work. Field supervisors/foremen must have completed at least an OSHA 10 Construction Outreach Program within the last 24 months.
- B. The field supervisors' safety responsibilities include, but are not limited to:
  - 1) Task specific safety training
  - 2) Safety inspections
  - 3) Tool box safety meetings
  - 4) Accident investigation
  - 5) Provide proof of completion of a Red Cross or approved equal for Cardio – Pulmonary Resuscitation (CPR), First Aid, Automated External Defibrillation (AED), and blood-borne pathogens training course
  - 6) Completion of drug and alcohol reasonable suspicion training.
  - 7) Capable of implementing the crisis management plan
  - 8) Authority to stop work when employee's or crew is exposed to hazardous conditions or potentially hazardous conditions.
  - 9) Capable of developing and leading JHA's and Daily PreTask Planning activities.

### 4.4 *DIA OCIP SAFETY TEAM*

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#### 4.4.1 *STATEMENT OF AUTHORITY*

- A. All persons who come into the work area for any reason during construction will be required to comply with the established safety regulations that govern the Project. The OCIP Safety Team is a representative of the City and County of Denver, Denver International Airport, and shall directly review and manage the requirements of the OCIP Safety Plan. If DIA OCIP Safety Team finds the Contractor areas of work or individuals being, or acting in noncompliance with OSHA or Site Specific Safety Plan requirements, or any other applicable regulations, the DIA Safety Team shall have the authority to order immediate correction and cessation of the non-compliant occurrence. Noncompliance with Project Safety Plan will be grounds for Contractor dismissal and/or employee(s) being forbidden entry onto the project. All costs of correction shall be borne by the Contractor deemed responsible. Nothing contained herein, however, shall serve to relieve the Contractor of his liabilities and/or obligations to the requirements set forth by OSHA, or other applicable Federal, State and Local requirements. The most stringent regulation shall apply if a conflict arises in the interpretation of the safety requirements of the DIA OCIP Safety Manual, Federal, State or local Government.

#### 4.4.2 RESPONSIBILITIES/DUTIES

- A. The OCIP Safety Team is responsible for generating and maintaining a high level of commitment for safe operations among all personnel assigned to the project site. Responsibilities and duties of The OCIP Safety Team include, but are not limited to, the following:
- 1) Compile, follow-up, and maintain safety performance statistics for the project. Communicate above information to the project's senior management to ensure they are informed and involved in the safety program.
  - 2) Keep apprised of new regulations and developments to keep the safety policies and procedures current and effective.
  - 3) Periodically conduct safety surveys of contractors' and subcontractors' activities to observe safety performance and make appropriate recommendations.
  - 4) Review and communicate methods and procedures to foster the highest level of accident prevention performance possible. Provide such information to the safety representative or designee.
  - 5) Act as an advisor providing consulting and training to the contractors and their subcontractors to enhance safety performance and best practices specific to the project.
  - 6) The focus of the safety efforts are on prevention of accidents through the safety plan, however there can be circumstances where accident investigations may be necessary to systematically determine the root cause, therefore the degree of detail required shall parallel the severity of the incident.
  - 7) Periodically attend contractor safety tool box meetings, review JHA's to ensure content and quality of the meetings are being achieved.
  - 8) Review all accident investigation reports to ensure thorough investigations were conducted to control future accidents.
  - 9) Disseminate safety bulletins.
  - 10) Distribute written information to the safety representative or designee regarding new proactive requirements, regulations or developments in safety.
  - 11) Review and evaluate contractors' safety meeting minutes to ensure that quality safety meetings are held.
  - 12) Provide the OCIP safety manual and its revisions throughout the course of the project. Provide other written safety information, posters, etc., as needed.
  - 13) Provide coordination with public and regulatory agencies.
  - 14) Participate in organizations such as ABC, AGC, ASSE, and National Safety Council to remain apprised of new developments in safety or any other professional electronic briefings as necessary.
  - 15) The DIA Safety Team will make available OSHA 10 and 30 Hour Construction Outreach training at reduced fee to all contractors. In the spirit of maintaining a proactive safety plan, other training shall be provided to contractors on the project at the discretion of the DIA Safety Team.

## SECTION 5. HEALTH AND SAFETY SPECIAL PROVISIONS

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### 5.0 CONTRACTOR'S SITE SPECIFIC SAFETY PLAN (SSSP)

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- A. The SSSP is essential to the successful and consistent implementation of OCIP Safety Program. The contractor/subcontractor will include costs to establish and maintain a safety program that meets or exceeds the requirements contained in this manual. A written site specific safety plan must be submitted for review by the Program Manager and OCIP Safety Team prior to the start of all site activities.
- B. Each SSSP must be tailored to the risks of the project. Some projects involve a variety of complex hazards and require substantial SSSP development with comprehensive guidance. See Model site specific safety plan in Appendix A.
- C. See additional requirements in Division 1 - Section 01110

#### 5.0.1 PRE-PROJECT HAZARD ANALYSIS

- A. The purpose of pre-planning is to prevent unnecessary hazards that are likely to occur during construction and to make sure each contractor performing an operation will have the necessary material and equipment on hand when needed.
- B. Due to the speed at which construction projects proceed, it does not allow a single operation to continue long enough to become safe through trial-and-error.
- C. To cope with safety problems peculiar to our industry, pre-project hazard analysis is required so that the Contractor's and Subcontractor's supervision can pre-determine anticipated hazards and develop an appropriate plan to prevent the hazards from becoming incidents.
- D. It is the responsibility of the contractor's project superintendent to ensure that Pre-Project Hazard Analysis is completed for their scope of work and their Subcontractor has completed a pre-project hazard analysis of their scope of work operations before initiating work on this project.
- E. Placing high risk activities on the project schedule ensures their visibility to key project personnel and fosters cooperation and communication of associated project risks.
- F. A copy of the pre-project hazard analysis shall be submitted to the DIA OCIP Safety Team prior to the start of work under contract.

### 5.1 DRUG FREE WORK ENVIRONMENT

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- A. This project is a drug-free work environment. Contractors and subcontractors, of any tier, will maintain a drug-free environment in accordance with the DIA OCIP Program.

Contractors/Subcontractors, of any tier, are responsible for testing any and all of their employees who work on the project for the presence of drugs or alcohol.

- 1) DIA/owner will pay for the cost of pre-employment substance abuse testing.
    - i. The contractor will be responsible to reimburse DIA for the cost of pre-employment drug testing for employees who do not receive safety orientated 30 days after the pre-employment drug screen is performed.
  - 2) Contractor is responsible for the cost and set up of post-incident and reasonable suspicion testing.
- B. Contractors and subcontractors, of any tier, will test their employees, as appropriate, throughout the construction process to include pre-employment, reasonable suspicion and post-incident testing to the extent necessary to implement drug-free work environment.
- C. Contractor and Subcontractor employees will only be granted access to the project after a "Negative" initial drug test. A document confirming that the employee has successfully completed a "Negative" initial drug test will be issued by the testing agency and shown to the Program Safety Manager/Program Manager. The employee will then be permitted to attend the project safety orientation.
- 1) If an employee is absent from the site more than 180 consecutive days, pre-employment testing will be required to regain site access.
- D. As soon as possible, but no later than 8 hours after an incident, the project requires any worker whose performance either contributed to the incident or cannot be completely discounted as a contributing factor to the incident if there is reasonable suspicion that drug(s) or alcohol influenced the workers performance. This will include any individual who is the cause of any incident resulting in damage to contractor or private property during work hours or project activity.
- E. Contractors and subcontractors will require post-incident testing when the following occurs:
- 1) Death or bodily harm to any person resulting in one or more of the following:
  - 2) Loss of consciousness;
  - 3) Necessity for medical treatment beyond first aid treatment;
  - 4) Disability which prevents the discharge of normal activities beyond the day of the accident.
  - 5) Estimated property damage, including cost of recovery value of lost product and damage to the property of the contractor or others or both, exceeding one thousand five hundred dollars (\$1500).
- F. Contractor must present a negative drug and/or alcohol screen to the Program Safety Manager for employees to return to the project site after post incident and reasonable suspicion testing.
- G. Employees who test at or above a 0.04 Blood Alcohol Content (BAC) will be removed from the project.
- H. Employees who test positive for illegal drugs or alcohol will be immediately removed from the project site.
- I. Managers and supervisors will be trained in recognizing the signs and symptoms of drug and alcohol abuse.

- J. Employees suspected of drug or alcohol abuse should be escorted by two individuals for witness purposes; one person being the supervisor and the other a non-management person.
- K. Employees failing post accident or reasonable suspicion drug tests will not be allowed to drive a motor vehicle when leaving the testing facility – they must find an alternative means of transportation, such as a family member or a taxi.
- L. The contractor shall carefully consider the expectations of individual privacy and confidentiality in retaining records under their policy. With the exception of the testing laboratory and the contractor's program administrator, drug test results may not be divulged to anyone without the expressed written authorization of the tested individual, unless requested by State agency officials as part of an accident investigation.
- M. Employees requiring drug and alcohol testing are required to complete the authorization form in Appendix T and present it to OccMed Colorado, LLC.
- N. To maintain confidentiality, written records regarding testing under the contractor's policy will be stored in a locked file or secure location. The records shall not be made a part of individual personnel files.
- O. Employees must report legal prescription drug use to their supervisor or manager if the medication could affect their ability to safely perform work. Certain side effects may impair attentiveness, judgment, response time, coordination, memory, etc. Contractors and subcontractors shall ensure that the employee's work responsibilities are consistent with any limitations resulting from legal prescription drug use. Prescription/medical marijuana use is prohibited.
- P. Each contractor shall submit a substance abuse policy that contains the following:
  - 1) Statement of Purpose
  - 2) Statement of Policy
  - 3) Policy Administration/Types of Drug (including testing for synthetics) & Alcohol Tests (Pre-employment, post incident, and reasonable suspicion)
  - 4) Positive & Negative Results
  - 5) Transporting employees to and from testing facility
  - 6) Use of prescription drugs
  - 7) Recordkeeping
  - 8) Training
  - 9) Right to Search
  - 10) Discipline
  - 11) Definitions
  - 12) Confidentiality

### **5.1.1 DRUG CLASS REQUIREMENTS AND SCREENING CUT-OFF CONCENTRATIONS FOR PRE-EMPLOYMENT, POST-INCIDENT AND REASONABLE SUSPICION TESTING**

| <b>Drug Class</b>           | <b>Screening Cut-Off Concentrations</b> |
|-----------------------------|-----------------------------------------|
| Amphetamine (d-Amphetamine) | 1000 ng/mL                              |
| Barbiturates (Butalbital)   | 200 ng/mL                               |

|                                             |            |
|---------------------------------------------|------------|
| Benzodiazepines (Nordiazepam)               | 300 ng/mL  |
| Cocaine (Benzoyllecgonine)                  | 300 ng/mL  |
| Methamphetamine-Ecstasy (d-Methamphetamine) | 1000 ng/mL |
| Opiates (Codeine/Morphine)                  | 2000 ng/mL |
| Oxycodone                                   | 100 ng/mL  |
| Phencyclidine (Phencyclidine)               | 25 ng/mL   |
| Propoxyphene (Norpropoxyphene)              | 300 ng/mL  |
| Cannabinoids (11-nor9-carboxy-THC)          | 50 ng/mL   |

- A. Post-incident and reasonable suspicion testing must meet the drug class requirements and screening cut-off concentrations identified in 5.1.1. *Pre-employment testing system being utilized is the MEDTOX Profile System.* [www.medtox.com](http://www.medtox.com)

### 5.1.2 OFF- SITE SUBSTANCE ABUSE TESTING FACILITY LOCATION – LESS THAN 25 EMPLOYEES

- A. Pre-employment testing facility location:  
 OccMed Colorado, LLC  
 3449 Chambers Rd, Suite B  
 Aurora, CO, 80011  
 Phone: (720) 859-6139  
 Hours: Monday – Friday 7:00 AM to 5:00 PM  
 Walk-in or call for testing. Recommend contacting clinic to schedule testing.

### 5.1.3 ON-SITE SUBSTANCE ABUSE TESTING FACILITY LOCATION – MORE THAN 25 EMPLOYEES

- A. To schedule onsite testing, contact Jason Jeffries at (303) 542-7183  
 1) Minimum of 7 days advanced notice is required.  
 2) Minimum of twenty-five (25) employees required
- B. Pre-employment testing facility location:  
 Worldport  
 24735 E. 75<sup>th</sup> Avenue, Suite 104  
 Denver, CO 80249

## 5.2 JOB HAZARD ANALYSIS (JHA)

- A. A job hazard analysis is a technique that focuses on job tasks as a way to identify hazards before they occur. It focuses on the relationship between the worker, the task, the tools, and the work environment. After identifying uncontrolled hazards, the contractor/subcontractor will take steps to eliminate or reduce them to an acceptable risk level. This is likely to result in fewer worker injuries and illnesses; safer, more effective work methods; reduced workers' compensation costs; and increased worker

productivity. The analysis also can be a valuable tool for training new employees in the steps required to perform their jobs safely. A job hazard analysis can be conducted on many jobs on this project. Priority should go to the following types of jobs:

- 1) Jobs with the highest injury or illness rates;
  - 2) Jobs with the potential to cause severe or disabling injuries or illness, even if there is no history of previous accidents;
  - 3) Jobs in which one simple human error could lead to a severe accident or injury;
  - 4) Jobs that are new to your operation or have undergone changes in processes and procedures; and
  - 5) Jobs complex enough to require written instructions.
- B. The contractor's or subcontractor's safety representative is required, when appropriate, to complete a JHA for non-routine and high risk tasks as described above and when directed by the OCIP Safety Team and review the findings with field supervisors/foremen. The JHA will be used by the field supervisor/foreman to participate in discussions regarding high risk and non-routine tasks with employees during daily pre-task planning. See Appendix B for JHA form and example.

### 5.3 *DAILY PRE-TASK PLANNING*

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- A. Daily pre-task planning enables contractor field supervisors/foreman and employees to participate in a discussion regarding the day's activities, associated risks, and the relevant control measures. Contractor and subcontractor's foreman or assigned competent person shall complete a daily pre-task plan, review it with all workers who will in turn sign the plan acknowledging the work and associated hazards to be performed. The plan shall be kept with the foreman during the shift; and retained on file for a minimum of 90 days. The plan shall be made available upon request by the DIA OCIP Safety Team.

### 5.4 *RISK MITIGATION TWO WEEK LOOK AHEAD*

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- A. Contractors and subcontractors shall submit a weekly summary of work tasks, associated hazards and control measures to the Program Manager and OCIP Safety Team. Contractor and subcontractor representatives who attend these progress meetings discuss risks of upcoming tasks and the planned mitigation measures. The weekly summary shall be discussed in the job progress meeting giving special attention to mobilization, demobilization, coordination efforts between crafts, audits, inspections, competent person changes, JHA development, training, liability, comments and recommendations. Contractors will add activities to these summaries at least two weeks in advance of the work. See Appendix D for Sample Risk Mitigation Two Week Look Ahead Form.

## 5.5 *STRETCH AND FLEX PROGRAM*

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- A. The contractor will implement a stretch and flex program acceptable to the OCIP Safety Team that is conducted prior to the start of each shift and after the lunch break where all employees will participate, to include subcontractors.

## 5.6 *SUBCONTRACTOR PRE-MOBILIZATION MEETING*

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- A. The contractor will conduct a subcontractor pre-mobilization safety meeting at the worksite on or before the first day of mobilization. The contractor's project manager, safety representative, supervisors and subcontractor's safety representative, competent persons shall attend this meeting.
- B. The purpose of this meeting is to review the subcontractor's pre-project hazard analysis, discuss site safety issues, requirements and address any special concerns. The Contractor shall present their approach to managing safety on high risk tasks. The sample site safety and health requirement checklist in Appendix E identifying procedures and hazards can be used to discuss and document this meeting. All attendees shall acknowledge understanding by their signature to the Contractor's checklist.

## 5.7 *MOTOR VEHICLES & EQUIPMENT*

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### 5.7.1 *PERSONAL VEHICLES*

- A. Must be parked in areas designated by the Program Manager that are free of construction activities.
- B. Personal vehicles are prohibited from accessing the project. If parked on-site without authorization, they shall be removed at the owner's expense.
- C. Routes approved for personal vehicles will be limited and appropriately marked.
- D. See Division 1 – Section 01016 for vehicle permitting requirements.

### 5.7.2 *JOBSITE VEHICLES & EQUIPMENT*

- A. All equipment shall be inspected daily before use by the Contractor's operator. All moving construction equipment (such as but not limited to forklifts, scissor/boom lifts, loaders) shall have a daily written checklist inspection displayed on the equipment during each work shift. Equipment that does not pass all checklist items will not be operated on site until repaired by qualified personnel.
- B. Defective equipment shall be repaired or removed from service immediately. If removed from service, a "red tag" shall be attached with an explanation of the defect and the date and name of the individual placing the equipment out of service.
- C. All Contractors' operators of construction equipment shall be properly licensed (where required), certified and classified as a competent person for that equipment. Copies of the certifications (and licenses if required) shall be maintained on project site by Contractor and made available upon request.



- D. Vehicles used to transport employees shall have seats firmly secured and adequate for the number of employees to be carried. All passengers shall be properly seated with seat-belt used. Standing/kneeling on the back of moving vehicles is prohibited.
- E. Drivers of motor vehicles shall have a valid state drivers license (CDL-Commercial Drivers License when applicable) and be instructed to exercise judgment as well as observe posted speed limits.
- F. Drivers must drive appropriately for existing weather conditions. This may require speeds below the posted speed limit.
- G. All Contractors' means of ingress and egress shall be adequately marked and kept clear of stored material, debris and equipment.
- H. Pedestrians always have right-of-way over motorized traffic.
- I. Horns shall be sounded at blind corners, when passing, and/or for warning.
- J. Established hand signals or turn signals are to be used.
- K. The use of cellular telephones, PDA's or other wireless devices (collectively referred to as "wireless devices") while operating motor vehicles and mobile equipment on projects site(s) is prohibited.
  - 1) Communication devices in vehicles for constant use for access control, communication with Air-Traffic Controllers and emergency response purposes are exempted from this policy.
- L. Reckless driving or other non-observance of these instructions will be cause for withdrawal of driving privileges on the project.
- M. Speed limits on project site and haul roads acceptable to the OCIP Safety Team will be posted by the contractor. Violations to the posted speed limit, traffic control devices and may be cause for removal from the project site.
- N. All vehicles permitted access to the site shall display the name of their company on the side, front or rear of the vehicle at all times while on the project. The company name or identification shall be visible and legible from a distance of 50 feet. Vehicles without proper identification will be removed at the Contractors expense.
- O. Seat belts shall be worn by all employees operating motor vehicles and any equipment with rollover protection structures during performance of work.
- P. Motor vehicle operation on the Air-side of the Denver International Airport must complete and pass the training and orientation required by DIA in accordance with FAA, TSA, DHS and any other agency requirements for operations of vehicles. See Division 1 – Section 01110 for additional requirements.
- Q. Golf carts, Kawasaki Mule buggies, John Deere Gators, or vehicles of such type must have Roll over protection that has been designed by the manufacturer , an orange flag for visibility, a horn, back up alarm and a seat belt installed before the vehicle is allowed on site.
- R. Motorcycles and bicycles are not permitted on the project site.
- S. See Division 1 – Section 01016 for additional requirements

## 5.8 CRANE OPERATIONS

### 5.8.1 CRANE OPERATORS

- A. Crane operators must be certified to operate the type of crane assigned by an accredited third party testing facility. Crane operator certification must be submitted to the OCIP Safety Team prior to crane assembly/operation. There are two ways that an equipment operator can be qualified or certified and meet DIA OCIP Safety requirements:
  - 1) A certificate from the National Commission of Certification of Crane Operators (NCCCO).
  - 2) Qualification from the employer through an accredited NCCCO testing organization.
- B. The crane operator shall not be responsible for hazards or conditions that are not under his direct control and that adversely affect the lift operations. Whenever the operator has doubt as to the safety of crane operations, the operator shall stop the crane's functions in a controlled manner. Lift operations shall resume only after safety concerns have been addressed or the continuation of crane operations is directed by the lift supervisor.

### 5.8.2 CRITICAL LIFT PLANS

- A. The Critical Lift Plan in Appendix F is required to be completed, approved in writing by the contractor and submitted for review by the OCIP Safety Team 7 working days prior to critical lifts taking place if:
  - 1) The gross load exceeds 75% of the crane's total lifting capacity
  - 2) The gross load at any point during the lift exceeds 75% of the crane's lifting capacity.
  - 3) The lift requires more than two cranes. Never to exceed 75% of each crane's lifting capacity in multi-crane lifts.
  - 4) The load will be swung over unprotected plant, equipment or service.
  - 5) The lift is performed in proximity of live electrical lines
  - 6) Hoisting of personnel.

### 5.8.3 SHARED SPACE AGREEMENT

- A. When two contractors/subcontractors have common or shared airspace with the potential for two crane booms and/or associated rigging to collide, a Shared Space Agreement must be developed by the two affected contractors and made available to the OCIP Safety Team. See Appendix G for sample Shared Space Agreement.

### 5.8.4 THIRD PARTY INSPECTION

- A. A third party inspector must oversee the erection and jacking of all tower cranes.
- B. Cranes assembled onsite must be inspected and certified by a third party inspector.
- C. Inspection documentation must be provided to the OCIP Safety Team after crane assembly/prior to operation.

### 5.8.5 CRANE ASSEMBLY/DISASSEMBLY

- A. Work is to be directed by an A/D (Assembly/Disassembly) director. The A/D director must meet the criteria for both a “competent person” and a “qualified person,” which are defined terms in this rule, or must be a “competent person” assisted by a “qualified person.”
- B. The A/D director must understand the applicable procedures.
- C. The A/D director must review the procedures immediately prior to beginning work unless he or she understands the procedures and has used them before for that equipment type and configuration.
- D. The A/D director must ensure that each member of the crew understands his or her tasks, the hazards of the tasks, and any hazardous positions or locations to avoid and be documented on the Pre-Task Planning sheet.
  - 1) Address hazards associated with the operation, including 12 specified areas of concern: site and ground conditions, blocking material, proper location of blocking, verifying assist crane loads, boom & jib pick points, center of gravity, stability upon pin removal, snagging, struck by counterweights, boom hoist brake failure, loss of backward stability, and wind speed and weather.
- E. The A/D director must verify all capacities of any equipment used, including rigging, lifting lugs, etc.

### 5.8.6 QUALIFIED RIGGERS

- A. Employers must use qualified riggers during hoisting activities for assembly and disassembly work. Additionally, qualified riggers are required whenever workers are within the fall zone and hooking, unhooking, or guiding a load, or doing the initial connection of a load to a component or structure.
  - 1) Contractors using riggers shall make available upon request, proof of documentation supporting the expertise of their qualified rigger.

### 5.8.7 QUALIFIED SIGNAL PERSON REQUIREMENTS

- A. A signal person is required when:
  - 1) The point of operation is not in full view of the operator.
  - 2) The operator’s view is obstructed in the direction the equipment is traveling.
  - 3) Either the operator or the person handling the load determines that a signal person is needed because of site-specific safety concerns.
  - 4) Contractor must use one of the following options to ensure that a signal person is qualified:
    - i. Third party qualified evaluator. The signal person has documentation from a third party qualified evaluator showing that he or she meets the qualification requirements.

- ii. Employer's qualified evaluator (not a third party). The employer's qualified evaluator assesses the individual, determines the individual meets the qualification requirements, and provides documentation of that determination. This assessment may not be relied on by other employers.
- B. Employers must make the documentation of the signal person's qualifications available at the worksite in paper form for review by the OCIP Safety Team. The documentation must specify each type of signaling (e.g., hand signals, radio signals, etc.) for which the signal person is qualified under the requirement of ASME B30.5-2007 and ASME B30.3-2009

### 5.8.8 OUTRIGGERS AND STABILIZERS

- A. When outriggers or stabilizers are used or are necessary in light of the load to be handled and the operating radius:
  - 1) Prior to crane operations, the contractor must evaluate the soil bearing capacity at the lift site to ensure that the crane, including the maximum intended loads is compatible with the location and placement of the crane. Review of any underground installations shall be part of the evaluation.
  - 2) Outriggers and stabilizers must be fully extended or, if permitted by manufacturer procedures, deployed as specified in the load chart.
  - 3) Outriggers must be set to remove equipment weight from the wheels.
  - 4) Outrigger floats, if used, must be attached to the outriggers; stabilizer floats, if used, must be attached to the stabilizers.
  - 5) Each outrigger or stabilizer must be visible to the operator or to a signal person during extension and setting.
  - 6) Outrigger and stabilizer blocking must be placed under the float/pad of the jack or, if there is no jack, under the outer bearing surface of the outrigger or stabilizer beam. Blocking must also be sufficient to sustain the loads and maintain stability and must be properly placed.
  - 7) Horizontal distance for crane setup from an excavation must be greater than the hole depth.

### 5.8.9 WORK PLATFORMS SUSPENDED FROM CRANES

- A. The use of a crane or derrick to hoist employees on a personnel platform is prohibited, except when the erection, use, and dismantling of conventional means of reaching the worksite, such as a personnel hoist, ladder, stairway, aerial lift, elevating work platform or scaffold, would be more hazardous or is not possible because of structural design or worksite conditions.
  - 1) Prior to use of a suspended personnel work platform, the contractor shall submit a written request to the OCIP Safety Team identifying the rationale for selecting a suspended personnel work platform and explanation why conventional methods would be more hazardous.

- B. The contractor's safety representative or designee must give the OCIP Safety Team a 7 day notice prior to any operation requiring the use of personnel platforms suspended from a crane.
- C. Prior to the use of a work platform suspended from a crane, the contractor and/or subcontractor will complete the Suspended Personnel Platform Checklist in Appendix H for each such operation and will maintain a file documenting its operation. Each record is good only for lifts made from a single crane set-up location. Traveling, repairs or modifications of the crane will require a new record. Each record is to:
  - 1) Be initiated by the supervisor of the employee who will be working from the platform
  - 2) Describe the work to be performed and its exact location
  - 3) List all required inspections, certifications, tests, and pre-lift meetings
  - 4) Be signed by the crane operator, rigger, and initiating supervisor
  - 5) Note the name of the person who will flag or signal the crane operator
  - 6) Remain with the crane while the personnel hoist is in progress
  - 7) Section 4 (Weight Calculation Sheet) of the Suspended Personnel Work Platform Checklist must be submitted to the OCIP Safety Team for review 7 days in advance of scheduled work.

## 5.9 *ELEVATED WORK - FALL PROTECTION*

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- A. Contractors and subcontractors of any tier shall provide the appropriate fall protection system against falls from elevations six (6) feet or more 100% of the time. This includes holes from drilled shafts when working within six (6) feet of the hole; and when working from elevated positions within six (6) feet of the leading edge. All fall protection equipment must be inspected by employees before each use. This equipment shall also be inspected by a qualified person at least monthly. Damaged and worn equipment must be removed from service and the project site immediately.

### 5.9.1 *TYPES OF FALL PROTECTION SYSTEMS*

- A. Personal fall arrest system is a means used to arrest an employee in a fall from a work level. It consists of an anchorage, connectors, a full body harness and may include a lanyard, deceleration device, lifeline, or a combination of these.
- B. Positioning device system allows an employee to be safely supported on an elevated vertical surface (such as a wall) and work with both hands free.
- C. *Warning line system* is a barrier erected to warn employees that they are approaching an unprotected edge. It also designates an area in which work may not take place without the use of a guardrail, personal fall arrest system or a safety net to protect employees.
- D. The use of safety monitors is prohibited.
- E. Guardrail system is a barrier erected to prevent employees from falling to lower levels. All guardrails must meet the requirements of 29CFR1926.502.

- F. Safety net system can be used when workplaces are more than 25 feet above the ground, water surface or other surfaces where the use of ladders, scaffolds, catch platforms, temporary floors, safety lines or a safety harness is impractical.

### 5.9.2 SAFETY HARNESS

- A. The only permissible fall arrest system on this project is an ANSI approved full body harness, subsystem and components.
- B. Safety harnesses must be secured to an overhead object of substantial capacity capable of supporting five thousand pounds (e.g. pipe, structure, cable, or rope lifeline). In order to accomplish this and ensure 100% protection, the employee may need to use two lanyards. The primary lanyard is never unhooked until the secondary lanyard is secure.
- C. The use of body belts is prohibited.

### 5.9.3 LANYARDS AND LIFELINES

- A. Lanyard and lifeline selection is determined by the type of work as well as the environmental conditions. If lanyards, connectors or lifelines may be damaged by welding, chemical cleaning, sandblasting, etc., either protect the components or use a more appropriate type of securing system.
- B. Lanyards and lifelines must incorporate or be used with an appropriate deceleration device. Deceleration devices include rope grabs, rip-stitch lanyards, specially woven lanyards, tearing or deforming lanyards, automatic self-retracting lifelines and lanyard, etc., which dissipate or otherwise limit the energy imposed on an employee during fall arrest.
- C. Once in use, the system's effectiveness is to be monitored by a qualified person. In some cases, a program for cleaning and maintaining the system may be necessary.
- D. Lanyards and lifelines must only use locking snap hooks.
- E. Under no circumstances must two lanyard snap hooks be connected together.
- F. Horizontal lifelines (HLL) shall be designed by a registered professional engineer, installed and maintained by a qualified person.
  - 1) Horizontal Lifeline Fall Distance. The primary factor that is critical to the design of HLL system is calculating the dynamic deflection of the lifeline. Other factors that must be accounted for include freefall of the worker, the deceleration distance of the worker's shock-absorbing lanyard or retractable lifeline and any other considerations that increase the worker's fall distance. The sum of these factors shall not be so great that the worker can contact an obstruction or lower level. The designer or manufacturer of a HLL system shall provide a method of calculating minimum clearances for temporary systems that can be installed in multiple configurations.
  - 2) Horizontal Lifeline Designed Load Factor. When HLL's are used, the Contractor shall have available upon request the appropriate engineered calculations for the system based on the number of workers attached to the HLL. The load requirement for HLL's is often confused with the 5,000 pound OSHA requirement for personal fall

- arrest systems (PFAS). The Contractor shall take into consideration in the design of the HLL, the maximum arresting force on a worker's lanyard may be greater than 1,800 pounds depending on the HLL's geometry, angle for sag, the lines elasticity and the dynamic deflection to the end loads at the anchorage points or stanchions.
- G. Anchor points, other than those installed by equipment manufacturers, must be inspected and approved by a qualified person.

#### 5.9.4 WRITTEN FALL PROTECTION PLAN

- A. Preparing and following a written, site specific fall protection plan is required for employees working at heights over 6ft. The plan must be submitted to the OCIP Safety Team 10 working days in advance of upcoming work for review. Changes to the plan must be discussed with the OCIP Safety Team. At a minimum, the plan will include:
- 1) Names of competent and qualified persons for fall protection.
  - 2) Identify the specific fall hazards in the work area (including location of fall hazards).
  - 3) Methods to be used for fall arrest or fall restraint.
  - 4) Overhead hazard protection measures (worker and public)
  - 5) Description of rescue methods/options for fallen personnel
  - 6) Identify how the plan will be enforced and the disciplinary actions for non-conformance.
- B. An informal meeting will be held between the OCIP Safety Team and the Contractor to discuss the details of site specific fall protection plan prior to commencement of work activity.

#### 5.9.5 TRAINING

- A. Contractor must provide a fall prevention training program for each employee who might be exposed to fall hazards. The training program must include recognition of the hazards of falling and procedures to follow to minimize these hazards. Training materials must be reviewed to verify that each employee has been trained, as necessary, by a competent person qualified in the following areas:
- 1) The nature of fall hazards in the work area;
  - 2) The correct procedures for erecting, maintaining, disassembling, and inspecting the fall protection systems to be used;
  - 3) The use and operation of guardrail systems, restraint systems, personal fall arrest systems, safety net systems, warning line systems, CAZS, and other protection to be used;
  - 4) The limitations on the use of mechanical equipment during the performance of roofing work on low sloped roofs;
  - 5) The correct procedures for the handling and storage of equipment and materials and the erection of overhead protection;
  - 6) The role of employees in fall protection plans;
  - 7) The requirements contained in 29 CFR 1926 Subpart M.

- B. Contractor must maintain a written certification record for employee training on site at all times for review. The record must contain the following information:
  - 1) The name or other identity of the employee trained
  - 2) The date(s) of the training;
  - 3) Topics reviewed; and
  - 4) Trainer and trainee signatures

## 5.10 FLOOR AND ROOF OPENINGS

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- A. Floor and roof hole covers shall be installed and maintained by the contractor creating the hole or the end user. In the event a contractor alters or removes a hole cover to complete work, they shall replace it, or make it safe, prior to leaving the work area. The covers must be of adequate strength to support potential loads, secured against displacement or lifting and labeled as a "hole" or "cover".

## 5.11 LADDERS

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- A. The purpose of this policy is to establish minimum expectations for personnel working with portable ladders. This policy applies to all work performed by Contractor's and their Subcontractors including, but not limited to the following activities: construction, installation, demolition, remodeling, relocation, refurbishing, testing, servicing or maintenance of equipment or machines, and any time ladders are required.
- B. This policy is intended to notify workers of the basic safety requirements associated with portable ladder use.

### 5.11.1 FALL PROTECTION

- A. All personnel using fall protection must be properly trained.
- B. If a job being performed on a ladder is rendered more hazardous by the use of personal fall protection, then the employee must:
  - 1) Ascend/descend the ladder, maintaining at least three points of contact with the ladder at all times.
  - 2) Maintain his/her center of gravity between the rails while performing work on the ladder.
  - 3) Always face the ladder while working or ascending and descending

### 5.11.2 GENERAL REQUIREMENTS

- A. Only fiberglass and wood ladders are allowed on site. Metal ladders (other than fixed building ladders) are prohibited on the DIA Project.
- B. Use a ladder for its intended purpose ONLY.
- C. Inspect ladder prior to use.
- D. Tag and dispose of defective ladders immediately.
- E. Identify every ladder with company name.



### 5.11.3 USAGE

- A. Ladders shall be used only on stable and level surfaces. All ladders must have slip resistant feet.
- B. Ladders placed in any location where they can be displaced by workplace activities or traffic, such as in passageways, doorways, or driveways, shall be secured to prevent accidental displacement.
- C. The area around the top and bottom of a ladder shall be kept clear and shall not be used for storage of unattended materials.
- D. The top of a straight ladder shall be placed with the two rails supported equally, unless it is equipped with a single support attachment.
- E. Straight/extension ladders shall extend a minimum of 3 rungs or 36" above the surface to be accessed and shall be secured.
- F. Folding step ladders shall ONLY be used in the fully open position, with spreaders locked.

### 5.11.4 STORAGE

- A. Ladders are to be stored in a secure manner that will not allow them to fall.
- B. Storage methods:
  - 1) Chained together upright
  - 2) Laid down flat stacked in a manner so they cannot tip/fall. Maximum of 4 stacked on top. (Head to toe)
  - 3) On supported wall racks designated for ladder storage
- C. When shift work is complete, the ladders will be returned to a designated storage area.

### 5.11.5 JOB BUILT LADDERS.

- A. Job built ladders shall comply with ANSI A14.4 – Safety Requirements for Job Made Ladders

## 5.12 SCAFFOLDING

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- A. All scaffolds and platforms must meet the following requirements:
  - 1) General Requirements
    - i. Scaffolds shall be erected, moved, dismantled or altered only under the supervision and direction under a competent person qualified in scaffold moving, erecting, dismantling or alteration. Such activities shall be performed only by experienced and trained employees selected for such work by the competent person.
    - ii. The competent person will determine the feasibility and safety of providing fall protection for employees erecting or dismantling support scaffolds. The contractor is required to provide fall protection for employees erecting or

dismantling support scaffolds where the installation and use of such protection is feasible and does not create a greater hazard.

- iii. Scaffolds six (6) feet or more above the ground or floor are to be completely decked and have handrails, midrails and toeboards installed. If for some reason, a platform or scaffold cannot be equipped with standard handrails or completely decked, safety harnesses must be worn and properly tied off.
- iv. Chain guardrails on scaffolding are not permitted.
- v. Overhead protection for employees on a scaffold is required if they are exposed to overhead hazards.
- vi. Barricade the area beneath the scaffold and post "working overhead" signs in all approach directions.
- vii. Contact the OCIP Safety Team if any special scaffolding issues arise.

## 2) Rolling Scaffolds

- i. No one is to ride on a rolling scaffold while it is being moved.
- ii. All materials and tools must be secured prior to moving a rolling scaffold.
- iii. No rolling scaffolds will be utilized to support other scaffolds.

## 3) Scaffold Planking

- i. Paint or stamp scaffold planks within 12" on each end or edge to denote use for scaffold decking only.
- ii. Use only 2" X 10" or 2" X 12" scaffold grade material for scaffold planking.

## 4) Tagging –The most effective means of communication between the scaffold builder and the scaffold user is a scaffold tag. The tagging procedures are as follows:

- i. The crew that erects the scaffold must complete and attach the appropriate scaffold tag.
- ii. The scaffold tag must be placed at eye level on or near the access ladder so it is easy to locate and plainly visible.
- iii. If the scaffold needs to be altered in any way, the person who signed the tag must be contacted to authorize the change and re-tag if necessary.
- iv. An untagged scaffold must not be used.
- v. Scaffolds shall be inspected and documented by a competent person before each shift. Scaffolds passing inspection shall have a green tag applied with the date of inspection and the inspector's signature.

## 5) Tagging System procedure:

- i. A green "Scaffold Use" tag shall be used for pre-shift inspections. Note: This tag shall be attached by the qualified person upon completion of the scaffold erection.
- ii. A yellow tag is completed and attached to scaffolds that cannot be erected with all the components complete. The yellow tag allows the erecting crew to note what portion of the scaffold is incomplete and cautions the user. A yellow tag also informs the user fall protection may be required.
- iii. A red tag means the scaffold is being dismantled not yet completely erected or for some reason not safe and shall not be used.

### 5.12.1 SCISSOR LIFTS

- A. Fall protection is not required when working from the platform of a scissor lift unless required by the manufacturer. Required is when the word “shall” or “must” is incorporated in the manufacture’s operators manual and/or instructions.
  - 1) The scissor lift shall not be used as a means of transfer material from the lift to another location.
  - 2) Employees shall always stand firmly on the floor of the scissor lift, and shall not sit or climb on the edge of the rails or use planks, ladders, or other devices for a work position.

## 5.13 AERIAL WORK PLATFORMS

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### 5.13.1 BOOM LIFTS

- A. Fall protection shall be worn by persons working from an aerial lift and the fall protection system shall be attached to the manufactures approved anchorage point on the boom or basket of an aerial lift. It is the responsibility of the user to review the manufacture’s operators manual for approved tie-off locations.
  - 1) Fall protection shall not be secured to an adjacent pole, equipment or structure when work is being performed from the basket of the aerial lift.
  - 2) Employees shall always stand firmly on the floor of the basket, and shall not sit or climb on the edge of the basket or use planks, ladders, or other devices for a work position.

## 5.14 EXCAVATIONS AND TRENCHING

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- A. Excavation and trenching are among the most hazardous construction operations. Excavations are defined as any man-made cut, cavity, trench, or depression in the earth’s surface formed by earth removal. A trench is defined as a narrow underground excavation that is deeper than it is wide, and is no wider than 15 feet.
  - 1) Contractors shall never enter an unprotected trench. Trenches 4 feet deep or greater require a protective system.
    - i. All soils will be classified as Type C soil when designing protective systems.
  - 2) Trenches 20 feet deep or greater require that the protective system be designed by a registered professional engineer or be based on tabulated data prepared and/ or approved by a registered professional engineer.
  - 3) There are different types of protective systems. Sloping involves cutting back the trench wall at an angle inclined away from the excavation. Shoring requires installing aluminum hydraulic or other types of supports to prevent soil movement and cave-ins. Shielding protects workers by using trench boxes or other types of supports to prevent soil cave-ins.
  - 4) When design/selecting a protective system the contractor must consider many factors: soil classification, depth of cut, water content of soil, changes due to

- weather or climate, surcharge loads (eg., spoil, other materials to be used in the trench) and other operations in the vicinity.
- 5) Trenches must be inspected daily and as conditions change by a competent person prior to worker entry to ensure elimination of excavation hazards.
  - 6) Safe access and egress must be provided by the contractor to all excavations including ladders, steps, ramps, or other safe means of exit for employees working in trench excavations 4 feet or deeper. These devices must be located within 25 feet of all workers.
  - 7) Heavy equipment shall be kept a safe distance away from trench edges.
  - 8) Surcharge loads must be kept at least 2 feet from trench edges.
  - 9) Testing shall be performed for low oxygen, hazardous fumes and toxic gases.
  - 10) Competent person shall inspect trenches at the start of each shift and as necessary throughout the shift as conditions change.
  - 11) Contractors are not permitted to work under raised loads.
  - 12) Prior to beginning any excavation, digging, trenching or drilling operation, contractors or subcontractors, of any tier, must ensure that all underground utilities have been located and verified by the responsible parties.

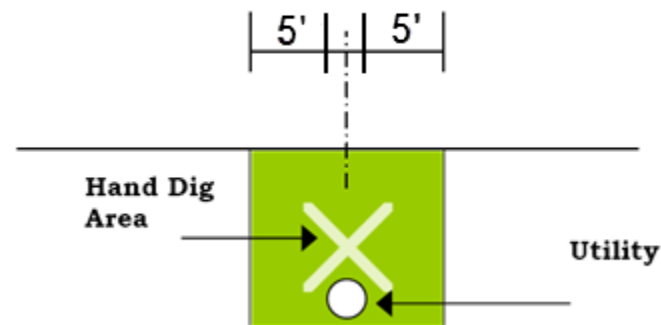
#### **5.14.1 UNDERGROUND UTILITY DAMAGE PREVENTION WORK PLAN**

- A. Underground Utility Damage Prevention. The contractor is responsible for complying with all OSHA regulations and Division 1 – Section 01020 related to underground utility damage prevention. The contractor shall take all reasonable steps necessary to make certain that all active, abandoned, or unknown utilities are identified. Such steps are to include the utilization of an individual or firm acceptable to the Contractor and knowledgeable in Subsurface Utility Engineering (SUE) techniques, and competent to perform utility designation in conformance with the National Utility Locating Contractors Association (NULCA) Standard 101 for Professions Competence Standards for Locating Technicians or other written standard acceptable to the OCIP Safety Team.
  - 1) Preparation
    - i. All existing underground utilities depicted on the drawings, (which include but are not limited to: power, control, and communications cables; telephone, water and sewer lines; and other utilities) are shown in their approximate locations only. Other utility lines may exist but not be depicted. It is the contractor's responsibility to ensure that locations of all underground airport, FAA, public, and/or private utilities are established prior to work in the area.
    - ii. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
    - iii. Protect subgrade and foundation soils against freezing temperatures or frost. Provide protective insulating materials as necessary. Protect subgrade and foundation soils from softening and damage by rain or water accumulation.

- iv. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- 2) Pre-excavation Requirements for Underground Utility Installations
- i. Prior to any excavation, the contractor shall layout in the field the centerline of all proposed utilities. In addition the contractor shall white line (by white spray paint or other means acceptable to OCIP Safety Team) the limits of construction including the area(s) to be excavated. The contractor shall also identify the proposed placement of grounding rods and cathodic protection.
  - ii. The contractor shall identify the location of existing underground utilities on as-built drawings, including any unknown or abandoned utility found during construction. The contractor shall ensure that all Airport officials, FAA technicians, other utility owners/operators, and Colorado 811/Utility Notification Center of Colorado performing utility designation/location services designate/mark existing utilities within the construction limits as well as the entire path of excavation, including five (5) feet to either side of proposed utilities. The contractor shall be solely responsible for notifying relevant utility owners/operators and Colorado 811 sufficiently in advance to ensure that delays to construction does not occur.
  - iii. After completion of the utility designation described above, the contractor shall hire a professional Subsurface Utility Engineering (SUE) or utility designation/locating company, acceptable to the OCIP Safety Team, to designate and sweep the entire excavation area, including five (5) feet to either side of proposed utilities, to confirm the locations of the marked utilities and identify and mark any additional unidentified utilities that may be within the limits of excavation.
  - iv. The contractor shall notify the OCIP Safety Team of the preferred date and time for a pre-work meeting for all excavation work. The contractor will coordinate the pre-work meeting with utility owners, local Airport Authority, FAA, and others as applicable to walk the excavation area and review applicable documentation. The contractor shall arrange to have its excavator and SUE (or designation firm) at the pre-work meeting. The contractor shall provide a written excavation work plan acceptable to the OCIP Safety Team that includes a contingency plan to restore to service all utilities including cables that may be placed out of service or damaged during performance of the work. The work plan at a minimum shall include:
    - a. A list of qualified subcontractors such as plumber, electrician, fiber optical cable splicer, and others as applicable for emergency repair purposes. Due to current FAA/TSA/Airport security requirements, the contractor shall ensure that these subcontractors have passed any airport security and registration requirement so they can be presented immediately at the job site when emergency repair is warranted.
    - b. The contractor shall coordinate with the OCIP Safety Team to request an Emergency Procedures Plan from the Airport Authority or facility manager.

This plan will outline special procedures during emergencies, disasters, accidents and injuries. The contractor is to review the Emergency Procedures Plan with all its personnel prior to construction and every quarter thereafter.

- c. The contractor shall investigate and provide a list of sketches/drawings to all disconnects to electrical circuits, jet fuel lines, natural gas, and main water sources that feed the services in the project area and its vicinity. All disconnects and shut-off valves shall be noted with special notation and procedures if required by the utility owners/operators.
- d. Name of the SUE or utility designation firm including training and experience of the technician who will be performing the utility designation as well as equipment that will be used for sweeping the area to be excavated.
- e. Name of the excavator including training and experience of the equipment operator who will be doing the work.
- v. Contractor shall expose all utilities that it will be crossing through non-destructive mechanical excavation methods such as vacuum excavation or similar mechanical method(s) approved by the OCIP Safety Team ("potholing") or by hand digging. When a cable is located, the contractor shall hand-excavate a trench (5) feet each side of the exposed utility to verify that another cable is not adjacent to the exposed utility.



- vi. Life threatening utilities such as gas and electrical services will be exposed through the entire length of the excavation by non-destructive methods.
  - a. Gas and electric lines within 25 feet of the work area shall be potholed and marked every 25 feet to verify that the line has not changed directions.
  - b. Gas and electric lines outside the 25 feet of the work zone will be potholed at least once on each end of the limits of the excavation to verify Underground Service Alert and the utility plans.
  - c. Fiber-optic lines will be potholed every 25 feet within the work area.
  - d. Telephone/Cable lines will be potholed every 50 feet within the work area.
- vii. Contractor shall continuously maintain utilities, facilities and/or systems that are or may be affected by work associated with the project. The contractor shall provide the OCIP Safety Team with written reports on any utility damage
- viii. If the contractor does not find an underground utility that was previously marked, the excavation shall be stopped, the contractor's safety representative

shall be contacted, and the contractor shall contact the appropriate owner/operator of the utility, using the Colorado 811/Utility Notification Center of Colorado when warranted.

- ix. Every attempt shall be made to preserve the locate markings during excavation. Locate markings that are no longer visible shall be refreshed by calling the one-call system and/or the utility owners/operators for remarking.
- x. All existing utilities that have been exposed during exploratory potholing or excavation must be supported to prevent stretching, kinking, or damage to the existing utility.

### 3) Excavation

- i. Preserve, protect and maintain existing operable drains, sewers, and electrical ducts during grading, excavating and backfilling operations.
- ii. Excavation made with power driven equipment is not permitted within five feet of any known existing utility. Start hand excavation on each side of the indicated obstruction and continue until the obstruction is uncovered.
- iii. An observer shall be present to assist the equipment operator when operating equipment around known underground facilities and utilities. Adhere to the following during excavation:
  - a. All mechanized excavation shall start with 6 to 10 inch depth excavation on the surface. The equipment operator shall immediately cease operation and notify the OCIP Safety Team if utility warning tapes, sand, or bedding material is uncovered at any time during excavation.
  - b. All excavations within 5 feet of any pedestal, closure, riser guard, pole (with riser), meter, or other structure shall be performed by hand digging or other means such as vacuum excavating.
  - c. If the contractor discovers damage, causes damage, or even contacts an existing underground utility, the owner/operator of that utility, and OCIP Safety Team shall be notified immediately.
  - d. If there is a critical or high priority utility line in the dig area, make arrangements for the utility owner/operator to be on the job site during the excavation. If the utility owner/operator refuses to be present, document this response.
- iv. The contractor shall coordinate on a daily basis with the excavator and the excavating work crew regarding the work to be performed that day with an emphasis on the underground utility damage prevention work plan and anticipated utility crossings.

## 5.15 *HAZARDOUS CHEMICALS*

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### 5.15.1 *HAZARDOUS MATERIALS AND HAZARDOUS WASTE*

- A. Contractors are responsible for developing and implementing their own written Hazard Communication Program as part of the SSSP. They must also ensure the proper

handling, labeling, use, and storage of these chemicals and provide access to Material Safety Data Sheets (MSDS) for all employees.

- B. An EPA ID number will need to be obtained for the hazardous wastes produced by the contractors and/or subcontractors.
- C. All hazardous wastes produced by the contractors and/or subcontractors must be removed from the project site by a licensed hazardous waste hauler. Such loads will need to be manifested and a copy of the manifest sent to the OCIP Safety Team.
- D. All hazardous materials must be properly labeled and stored until removed from the project (by a licensed hazardous waste hauler).
- E. Hazardous materials or hazardous wastes stored in 30 or 55 gallon drums are to be placed on spill containment pads.
- F. Report all accidental releases of a hazardous material or hazardous waste promptly to 303-342-4211 . If the release is of a reportable quantity, the responsible contractor or subcontractor, of any tier, will notify the appropriate regulatory agency.
- G. Proper clean-up of accidental releases of hazardous materials waste will be done by the responsible contractor or subcontractor. Clean-up is to be done by properly trained personnel. Hazardous waste from the clean-up must be hauled away by a licensed hauler. The OCIP Safety Team must be given a copy of the hauler's manifest.
- H. Depending on the hazardous materials spilled, DIA OCIP Safety Team may require the responsible contractor or subcontractor to hire a certified laboratory to take an appropriate number of soil samples to test at their laboratory. A copy of the results is to be given to the OCIP Safety Team.
- I. Contractors or subcontractors, of any tier, must inspect their hazardous material and waste storage areas at least weekly to ensure they are properly maintained.
- J. The DIA OCIP Safety Team will randomly audit the labeling and storage of hazardous material and waste and the disposal of hazardous waste to verify that all contractors and subcontractors, of any tier, are fulfilling their roles as responsible parties.
- K. Consideration shall be given to chemical compatibility prior to storage of chemicals.

### 5.15.2 MATERIAL SAFETY DATA SHEETS (MSDS)

- A. As part of the written HAZCOM program, a hazardous chemical list must be maintained. The OCIP Safety Team or another contractor may request copies of the most current MSDS on a chemicals being used by other contractors/subcontractors.

## 5.16 CONFINED SPACE ENTRY

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- A. Confined spaces include, but are not limited to, tunnels, manholes, utility vaults, pumping stations, storage tanks, process vessels, pits, vats, vaults or similar types of enclosures with limited access and without proper ventilation. Entry into confined spaces may be for the purpose of inspection, testing of equipment, maintenance (repair and cleaning) or an emergency. The Contractor or Subcontractor performing confined space entry shall submit an exposure-specific Confined Space Entry Procedure in writing as part of their SSSP and include at a minimum, the following elements.



### 5.16.1 IDENTIFYING OF CONFINED SPACES

- A. During the pre-project hazard analysis or JHA development the Contractor shall identify confined spaces. The characteristics of a confined space are:
  - 1) A space that is large enough and so configured that an employee can enter and perform assigned work, and
  - 2) A space that by design that has limited openings for entry and exit; and
  - 3) A space not designed for continuous employee occupancy.

### 5.16.2 PERMIT REQUIRED/ NON-PERMIT REQUIRED CONFINED SPACE

- A. The Contractor is required to evaluate the worksite to determine if there are any potential or actual hazards in any confined spaces. Based on the hazards present, each space will be categorized as a permit required or a non-permit required confined space.
- B. A permit required confined space has one or more of the following characteristics:
  - 1) A potential to contain a hazardous atmosphere;
  - 2) Material that can cause the engulfment of an employee;
  - 3) An internal configuration that might cause an employee to be trapped or asphyxiated by inwardly converging walls or by a floor that slopes downward and tapers to a smaller cross section; or
  - 4) Contains any other recognized serious health or safety hazard.
- C. A non-permit required confined space is a confined space that does not contain any hazard capable of causing death or serious physical harm, and has no atmospheric hazard, nor the potential for any atmospheric hazard. These conditions must be verified by the contractor.
- D. If there are permit required spaces on the jobsite, the Contractor must inform exposed employees of the existence and location of these spaces and prevent unauthorized entry into these spaces. Permit confined spaces must be posted with signs stating Danger: Permit Confined Space. Do Not Enter.

### 5.16.3 PERMIT REQUIRED CONFINED SPACE ENTRY PROGRAM

- A. If the Contractor determines that its employees will enter permit-required confined spaces, a written confined space entry program must be submitted for review. In this program, the Contractor must describe how they will comply with the requirements of the standard. The written program must include the following:
  - 1) How the employer will implement the measures necessary to prevent unauthorized entry;
  - 2) Identification and evaluation of the hazards of permit spaces before employees enter them;
  - 3) Equipment needed to perform a safe entry operation;
  - 4) Procedures for atmospheric testing of the space;

- 5) Provision of at least one attendant outside the space;
- 6) Provision for responding to emergencies;
  - i. Description of rescue equipment to be used
- 7) Designation of all persons with active roles (e.g. entrants, attendants, persons who test and monitor) and provision of required training;
- 8) Procedures for summoning rescue and emergency services;
- 9) System for the preparation, issuance, use and cancellation of entry permits;
- 10) The system developed and implemented for the closing off the permit space and cancellation of entry permits; and
- 11) Procedures to coordinate operation where more than one contractor (such as a subcontractor) is involved;
- 12) Procedure for evaluation and correction of entry operations when the contractor has reason to believe that the program is not sufficiently protective; and
- 13) The mechanism by which the confined space permit entry program is reviewed.

#### 5.16.4 ENTERING A PERMIT-REQUIRED CONFINED SPACE

- A. Entry is defined as occurring when any part of the body passes through the opening of a confined space. Prior to entry, an entry permit should be completed and signed by the entry supervisor verifying that the space is safe to enter. The entry permit must also be posted at the entrance or otherwise made available to entrants before they enter the permit space.

##### 5.16.4.1 ENTRY PERMIT

- A. An entry permit must be filled out before an employee enters a confined space (and posted at or near the confined space.) The permit shall contain the following types of specific information concerning:
  - 1) Identification of space;
  - 2) Purpose of entry;
  - 3) Date and duration of permit;
  - 4) List of authorized entrants;
  - 5) Names of current attendants and entry supervisor;
  - 6) The hazards of the permit space to be entered;
  - 7) The measures used to isolate the permit space and eliminate or control hazards;
  - 8) The acceptable entry conditions;
  - 9) The results of atmospheric monitoring;
  - 10) Rescue and emergency services that can be summoned and the means for summoning those services;
  - 11) The communication methods used by entrants and attendants to maintain contact;
  - 12) Any other safety information necessary for the specific space;
  - 13) Any additional permits, such as for "hot work" (welding).

- B. The entry permit is the document that certifies that the Contractor complies with the requirements of the standard for entries in permit required confined spaces. Also, the entry supervisor must close off the space and cancel permits when an assignment has been completed or when prohibited conditions exist. All new conditions must be noted on the canceled permit and used in revising the permit space program.

#### 5.16.4.2 MONITORING

- A. Before entering the area, the contractor must always test for oxygen content of the air, then flammable or explosive gases or vapors, and finally toxic chemicals such as hydrogen sulfide. This sampling should be done with a remote monitor on a wand attached to the toxic gas meter. The monitor should be able to reach the lowest point in the confined space. Oxygen monitoring should be done first as the explosive gas monitor will not be accurate if there is an oxygen deficiency.
- B. It is important to remember that some gases or vapors are heavier than air and will settle at the bottom of the confined space. Also, some gases are lighter than air and will be found around the top of the confined space. Thus, during the sampling process it will be necessary to test all areas (top, middle and bottom) of the confined space.
- C. In sewers or other areas which are part of a continuous system where new hazards may enter at any time, continuous air monitoring must be conducted.

#### 5.16.4.3 VENTILATION

- A. If the atmosphere is found to lack oxygen, or contain toxic gases and vapors, the space must be ventilated before entry. An air powered ventilator placed at the top of the opening can blow breathable air into the space. Never assume that the space is safe until it is monitored again. Ventilation shall continue while the employee is working in the space. A trained person must determine whether the air must be blown or sucked, and how the ventilation should be conducted.
- B. The air intake should be placed in an area that will draw in fresh air only. Ventilation should be continuous where possible, because in many confined spaces the hazardous atmosphere will form again when the flow of air is stopped.
- C. The forced air ventilation should ventilate the immediate areas where an employee is or will be present within the space and should continue until all employees have left the space.

#### 5.16.4.4 PROTECTIVE EQUIPMENT

- A. Personal protective equipment shall be used to protect workers only after all other feasible means have been used to control or eliminate hazards. A full body or chest harness and a lifeline should be used when entering a confined space.
- B. In some situations, a respirator will also be needed. A respirator will allow the employee to breathe without inhaling toxic gases or particles.

- C. Air-purifying respirators can filter dangerous substances from the air, but they provide no protection in an oxygen deficient environment and shall not be used when working in a confined space. Only air-supplying respirators (SAR/SCBA) should be used in confined spaces that have low oxygen levels or high levels of toxic gasses.
- D. In vertical entries, the safety harness should be attached to a retrieval device that will allow quick removal of an employee in the event of an emergency. In the event of an emergency, the attendant located on the outside should be able to initiate a rescue without entering the space.
- E. Hard hats, safety goggles, face shields, gloves, safety boots, disposable suits, earplugs or muffs, non-sparking flashlight and tools may also be needed when entering a confined space.

#### 5.16.4.5 RESCUE

- A. In order to facilitate rescue without having a rescuer enter a space, the Contractor must require the use of "non-entry" rescue, retrieval systems or methods, such as tripods and winches to lift unconscious or injured entrants out of a space that is more than five feet deep.
- B. Where entry must be made for rescue, OSHA allows rescue to be performed either with the facility's trained in-house rescuers or by contracting to an outside rescue service. The Contractor must identify on the permit the type of rescue to be performed for each confined space.
  - 1) In-house Rescue: The Contractor's rescuers must have extensive training. No employee -- even an attendant -- is authorized to enter a space to rescue an entrant unless he or she has had extensive training in personal protective and rescue equipment. This includes actual practice in making simulated rescues and CPR.  
**NOTE:** Even a trained attendant may not enter a space to make a rescue -- even if he or she is trained -- until another attendant has arrived.
  - 2) Outside Rescue: If the contractor is relying on an outside agency to perform a rescue, the rescue service must be informed of the hazards they may confront, and the rescue service must have access to all permit spaces so that the rescue service can develop appropriate rescue plans and practice rescues before a rescue must be made. **NOTE:** If the Contractor is expecting to use an outside agency to perform rescue (such as the fire department) they must have and make available a written agreement between the agency and the Contractor. The contractor will obtain written verification from the rescue service, prior to each entry that they would be readily available to respond in a timely manner.

#### 5.16.5 TRAINING

- A. Proper training, careful preparation and good judgment are essential to safe confined space entry. The Contractor is required to provide initial and refresher training to equip

employees with the understanding, skills and knowledge necessary to perform the confined space entry safely.

- B. Training should be provided to each affected employee before the employee starts performing assigned duties in confined spaces and must be certified by the contractor. Authorized entrants, attendants, supervisors and rescuers require different levels of training according to their specific duties and responsibilities.

#### **5.16.6 ALTERNATE ENTRY PROCEDURES FOR PERMIT REQUIRED CONFINED SPACES**

- A. Where the contractor can prove that the only hazard present in a confined space is an actual or potential atmospheric hazard that can be controlled through ventilation alone, the contractor can use alternate entry procedures. This means that a permit is not required before entry, rescue arrangements do not have to be made and no attendant is required.
- B. It is extremely important that any contractor who attempts to use alternate entry procedures follow the requirements listed below.
- C. The contractor must do the following to use alternate entry procedures:
  - 1) Demonstrate that the only hazard posed by the space is an actual or potential hazardous atmosphere. This means that any hazards involving high noise levels, lockout-tagout, drowning, high heat or cold, slips, trips or falls, or any other hazard must be eliminated.
  - 2) Demonstrate that continuous forced air ventilation alone is sufficient for safe entry.
  - 3) Develop monitoring and inspection data to support bulleted item one and two above. If initial entry into the space is necessary to collect such data, the entrant must follow the complete permit program.
  - 4) Make available to each employee who enters the space the data collected to prove that the space qualifies for alternate entry procedures.
- D. The following requirements must be met before entry:
  - 1) The internal atmosphere must be tested for oxygen content, flammable gases and vapors and potential toxic air contaminants to assure that there is NO hazardous atmosphere in the space.
  - 2) Continuous forced air ventilation must be used in the area where the employee will be present in order to control any hazardous atmosphere.
  - 3) The air within the space must be periodically tested to assure that ventilation is preventing the accumulation of a hazardous atmosphere. The entrant must immediately leave the area if a hazardous atmosphere is detected. NOTE: Although OSHA only requires periodic monitoring in this case, employees working alone -- especially in sewers or other areas that are parts of a continuous system -- shall be constantly monitored using personal atmospheric monitoring equipment that sounds an audible alarm when dangerous conditions occur.
  - 4) The employer must provide written certification to the OCIP Safety Team that the above measures have been taken.

## 5.17 *PERSONAL PROTECTIVE EQUIPMENT*

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- A. All employees and visitors to the project site must use the protective equipment prescribed by local, state, federal, and project rules and regulations. It is the intent of OCIP to control or minimize exposures that will or could lead to illness or injury.
- B. All personnel on the construction site must adhere to the following policies:

### 5.17.1 *EYE PROTECTION*

- A. ANSI Z87.1 safety glasses with side shields shall be worn at all times while in the work area.
- B. Wearers of contact lenses must also wear appropriate eye and face protection devices in a hazardous environment. It should be recognized that dusty and/or chemical environments may represent an additional hazard to contact lens wearers. Hazardous environments may include, but are not limited to those in which a respirator may be required or where welding is being performed.
- C. Where appropriate, contact lenses may be worn if approved by both the contractor and the employee's physician. These approvals are to be documented and kept in the contractor's file on site.
- D. If the task requires an employee to wear goggles, basic eye protection should not be worn since a good seal cannot be obtained.
- E. When contractors' or subcontractors' employees are exposed to flying particles, splashes, mists, etc., they must wear an approved face shield as well as basic eye protection (since a face shield provides only protection to the face and eyes from direct impact objects).
- F. When welding, a welding hood as well as both basic eye protection and a hard hat must be worn. This is to protect employees from hot slag when the hood is raised and from overhead work exposures.

### 5.17.2 *HEAD PROTECTION*

- A. All project work areas are considered "hard hat areas".
- B. Everyone, including delivery personnel, vendors and visitors must wear approved hard hats while on the project. Hard hats are not required in construction parking lots and office trailers.
- C. Employee's first, last name, contractor/subcontractor company names are to be displayed on the front of all hard hats that are issued to their employees.

### 5.17.3 *HEARING PROTECTION*

- A. Contractors, Subcontractors, vendors, and visitors shall be required to wear hearing protection when working in, or passing through high noise areas. It shall be the responsibility of the contractor or subcontractor to provide the hearing protection for their staff and document that training is provided. In addition, employees shall be issued

or made readily available hearing protection such as but not limited to disposable ear plugs with an NRR 30.

- B. The contractor's safety representative or designee will monitor work areas to recognize and post high noise areas.
- C. Once an area is posted, notify OCIP Safety Team.

#### 5.17.4 FOOT PROTECTION

- A. All trades must wear shoes or boots with substantial soles (no leather soles) and include uppers that extend above the ankle shall be worn at all times. Any work tasks requiring special foot wear requires a PPE hazard assessment to be completed.
- B. No one is permitted to wear sneakers (including ANSI approved sneakers), tennis shoes or athletic shoes of any type, sandals, high heels or flip flop thongs on this project.
- C. Metatarsal covers are required for operating jackhammers, earth compacting equipment (jumping jacks), and other similar activities when designated.

#### 5.17.5 CLOTHING

- A. Clothing suitable for the weather and your work shall be worn. Torn or loose clothing, cuffs, jewelry or neckwear that may be a hazard are not allowed. Shirts shall be worn and have sleeves measured at least four inches from the shoulder seam. Pants shall have full length legs (no shorts allowed). Clothing shall be maintained in a clean, neat and repaired fashion. Clothing and personal protective equipment shall not exhibit any form of inappropriate or profane drawing, photographs, language (foreign or English), related to sex, race, national origin, gang related or personal opinion.
  - 1) All employees working with electrical energy must be protected by clothing covered by NEC 70 E.
  - 2) Shoulder length or longer hair must be tied back and put under the hard hat or worn in a hair net. (This will keep it from impeding vision, becoming entangled in machinery or preventing the use of personal protective equipment).
  - 3) High visibility/reflective vests, shirts or jackets shall be worn by all personnel working in all construction areas. The high visibility/reflective PPE must meet the requirements of ANSI/SEA 107-2004 publication entitled "American National Standard for High Visibility Safety Apparel and Headwear" or equivalent revisions and labeled as meeting the ANSI 107-2004 standard performance for Class 2 or 3 risk exposure for the respective project sites.
    - i. Exception: Workers who are welding, cutting or brazing are exempt from wearing a high visibility vest while performing the task, however once completed and moving about the project, the high visibility vest shall be worn.

#### 5.17.6 HAND PROTECTION

- A. This project has implemented a 100% glove policy for the project. During the pre-project hazard analysis or JHA development, hand protection shall be selected based upon the

hazard and performance characteristics of the glove. Gloves must be available and worn by contractor employees performing a task:

- 1) When materials with sharp edges are exposed or being handled such as but not limited to:
    - i. Sheet metal siding, roofing, etc.;
    - ii. Metal materials, such as Unistrut and all thread rods;
    - iii. Tie-wire;
    - iv. Metal floor grating;
    - v. Wire rope;
    - vi. Metal studs;
    - vii. Metal ductwork;
    - viii. Metal light fixtures;
    - ix. All metal material which has the potential to inflict a cut/laceration;
    - x. Handling of glass;
    - xi. Cutting operations involving hand held, non-power operated cutting tools,
    - xii. Handling of wood materials such as, plywood sheeting on floors, scaffolds, unloading and loading of any wood type, movement and transfer of wood;
    - xiii. During the use of utility knives, razors or knives of any kind;
    - xiv. While pulling wire in and around electrical panels.
  - 2) When performing the following tasks:
    - i. Concrete operations where hands are exposed to power and trowel operations;
    - ii. Cleaning chutes used for delivery of cement; concrete removal operations;
    - iii. During the use of impact tools Anti-Vibration Gloves shall be used such as, hammers to chip concrete, jackhammers, fence post drivers, compactors or jumping jacks;
    - iv. Working on or near materials affected by extreme temperatures such as items in excess of 60 degrees centigrade, items below 0 degrees centigrade;
    - v. While working with hazardous materials such as caustics, corrosives, oxidizers, solvents, paints, adhesives, and petroleum products;
    - vi. Workers involved with the removal and handling of trash.
    - vii. Whenever an MSDS suggests or requires the use of hand protection to avoid skin contact.
- B. Exceptions to the 100% glove policy are:
- 1) In cases where gloves may present a greater hazard, the contractor shall submit in writing justification for working without this protection.
  - 2) Anytime equipment or manufacturers manual states the use of gloves presents a greater hazard.
  - 3) Moving machinery where gloves can become entangled or caught between.

### 5.17.7 RESPIRATORY PROTECTION

- A. Contractor and subcontractors who require or permits employees to wear a respirator must have a written respiratory protection program as part of the SSSP. The written respiratory protection program shall establish standard operating procedures



concerning the use and maintenance of respiratory equipment. In addition to having such a written program, the contractor must also be able to demonstrate that the program is enforced and updated as necessary. The written respiratory protection program shall include:

- 1) A written statement of company policy, including assignment of individual responsibility, accountability, and authority for required activities of the respiratory protection program.
  - 2) Written standard operating procedures governing the selection and use of respirators.
  - 3) Respirator selection (from NIOSH/MSHA approved and certified models) on the basis of hazards to which the worker is exposed.
  - 4) Medical examinations of workers to determine whether or not they may be assigned an activity where negative pressure respiratory protection is required.
  - 5) Employee training in the proper use and limitations of respirators (as well as a way to evaluate the skill and knowledge obtained by the worker through training).
  - 6) Respirator fit testing.
  - 7) Regular cleaning and disinfecting of respirators.
  - 8) Routine inspection of respirators during cleaning, and at least once a month and after each use for those respirators designated for emergency use.
  - 9) Storage of respirators in convenient, clean, and sanitary locations.
  - 10) Surveillance of work area conditions and degree of employee exposure (e.g., through air monitoring).
  - 11) Regular inspection and evaluation of the continued effectiveness of the program.
- B. Respirators should be used for protection only when engineering controls have been shown to be infeasible for the control of the hazard or during the interim period when engineering controls are being installed.

## 5.18 HOUSEKEEPING

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- A. Materials shall be piled and stacked so that safe clearances are maintained and toppling is prevented.
- B. Spillage of fuel, oil or hazardous materials shall be reported to the 303-342-4211, Program Manager and OCIP Safety Team. Spills shall be cleaned up or contained immediately. The Contractor must have a Spill Cleanup Kit available on site. On-site disposal of oil or hazardous material is prohibited.
- C. Trash and garbage shall be placed by the contractors into appropriate containers. Debris is to be cleaned up daily. This project will have a "clean-as-you-go" policy. The contractor is responsible for monitoring this policy and pursuing any Subcontractor that is not in compliance.
- D. Nails protruding from lumber shall be removed or bent over immediately.
- E. Trash dumpsters may be located at the site. The disposal of trash into these dumpsters is the responsibility of each contractor. Trash removal from upper floors/work levels will require the use of trash chutes or some other safe means of trash removal. No one is

- permitted to throw or drop trash/debris from upper floors/levels to the dumpster or ground below.
- F. Unobstructed passageways for the movement of fire trucks, ambulances or similar emergency vehicles shall be maintained. A minimum of 15 feet (or as stipulated by the governing fire official) of clear, unobstructed access shall be maintained leading to fire hydrants and Siamese connections.
- G. All loose and combustible material shall be removed from work areas at the end of the workday or as wind and weather conditions dictate.
- H. Gang boxes and tool boxes shall not have materials stored on top of them.
- I. See Division 1 – Section 01710 for additional requirements.

### 5.19 SPILL PREVENTION

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- A. Contractors will store fuel, petroleum products, and hazardous materials at the construction yards in safe locations within secondary containment structures. Secondary containment systems normally consist of a bermed area lined with an impervious material to provide a minimum containment volume equal to 100 percent of the volume of the largest storage vessel contained within the bermed area. The contractor will construct these containment structures to contain spilled or leaked liquids within the structures. If earthen containment dikes are used, they will be constructed with slopes no steeper than 3:1 (horizontal to vertical) to limit erosion and provide structural stability. Containment areas will not have drains.
- B. The contractor will visually inspect aboveground bulk tanks frequently and whenever the tank is refilled. Drain valves on temporary storage tanks will be locked to prevent accidental or unauthorized discharges from the tank. The Contractor will correct visible leaks in tanks as soon as possible. All fuel nozzles will be equipped with functional automatic shut-off valves. Prior to departure of any fuel tank truck, all outlets on the vehicle will be examined by the driver for leakage and tightened, adjusted, or replaced to prevent leaking while in transit.
- C. Routine equipment maintenance of wheel-mounted vehicles such as oil changes will be accomplished at the contractor yards or staging areas to the greatest extent practical.
- D. Routine maintenance of track-mounted equipment will be conducted in a manner to gather all oil and other discharges and removed from the project site to a suitable recycling or disposal site.
- E. Where required, Contractors shall provide equipment diapers and/or drip pans to protect from environmental spills.
- F. The contractor will maintain a minimum of 20 pounds of suitable commercial absorbent and barrier materials at each contractor yard and on fuel and service trucks to allow rapid containment and recovery of a spill. In addition, fuel trucks will be equipped with shovels and an assortment of hand tools to aid in the containment of a spill.
- G. Equipment will not be washed on the project sites. Equipment operators will be held responsible for prompt reporting and mitigation of any fuel or lubricant spills from their equipment.

- H. Two trained personnel will be present during refueling to reduce the potential for spills or accidents. If the equipment operator is used as one of the two trained persons on the site, that person should be directly involved with the refueling process (i.e., not just sitting in the equipment) so that he/she can respond immediately to any overfilling.
- I. Equipment such as large stationary pumps may be fitted with auxiliary tanks as appropriate. Such auxiliary tanks will be placed within a secondary containment structure. Refueling of dewatering pumps, generators, and other small portable equipment will be performed using approved containers with a maximum volume of 10 gallons. Alternately, a pickup truck-mounted tank (up to 300 gallons) may be used to fill the secondary fuel tanks provided the pump hose has an automatic cut-off sensor and provided the person conducting the refueling does not leave the filling location.
- J. Before lubricants are drained from the construction equipment, a suitable containment vessel and plastic sheeting will be placed under the equipment to collect any spilled material. The contractor will take necessary precautions to ensure that material that might accumulate on the liner does not spill on the ground surface.
- K. The contractor will appoint a Spill Coordinator who will be responsible for the reporting of spills, coordinating contractor personnel for spill cleanup, subsequent site investigations, and associated incident reports.
- L. See Division 1 – Section 01566 for additional requirements

## 5.20 SANITATION

### 5.20.1 POTABLE WATER

- A. The contractor must adequately supply potable water on the project site
- B. Portable containers used to dispense drinking water shall be capable of being tightly closed, and equipped with a tap. Water shall not be dipped from containers.
- C. Any container used to distribute drinking water shall be clearly marked as to the nature of its contents and not used for any other purpose.
- D. A common drinking cup is prohibited.

### 5.20.2 TOILETS

- A. Toilets shall be provided for employees according to the following table:

| Number of Employees |                                           |
|---------------------|-------------------------------------------|
| 20 or less          | 1                                         |
| 20 or more          | 1 toilet seat and 1 urinal per 40 workers |
| 200 or more         | 1 toilet seat and 1 urinal per 50 workers |

- B. Toilet facilities shall be maintained in a sanitary condition

### 5.20.3 WASHING FACILITIES

- A. The contractor shall provide adequate washing facilities for employees engaged in the application of paints, coating, herbicides, or insecticides, or in other operations where contaminants may be harmful to the employees. Such facilities shall be in near proximity to the worksite and shall be so equipped as to enable employees to remove such substances.
  - 1) Hand soap or similar cleansing agents shall be provided
  - 2) Individual hand towels of cloth or paper, warm air blowers or clean sections of continuous cloth toweling, convenient to wash facilities, shall be provided.
  - 3) Washing facilities shall be maintained in a sanitary condition.

## 5.21 SEVERE WEATHER

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- A. Severe weather encompasses any weather-related event—tornado, severe thunderstorm, hurricane, flood, winter storm, temperature extremes—that poses a risk to life and property or impacts airport operations. The contractor shall develop a plan that focus on ensuring employee safety and minimizing equipment/property damage. The plan shall also include responsibilities, communications procedures, mitigation measures, preparedness activities, response actions, warning resources, safety and logistical considerations.

### 5.21.1 SNOW AND ICE REMOVAL

- A. The contractor will establish procedures in the event of snow, sleet, freezing rain, and/or ice accumulation to provide safe access to the site, parking areas, walking surfaces and haul roads. The plan will include responsibilities, communication procedures, priorities for snow and ice removal of all sidewalks, parking lots, roadways, and designated parking areas on the project.

## 5.22 ELECTRICAL

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- A. Only qualified electricians may perform electrical work.
- B. Temporary electrical service shall be installed and maintained to conform to all of the requirements along with all applicable provisions of the NESC, NEC and OSHA.
- C. Where required, appropriate warning signs will be posted. All temporary components shall be plainly marked to indicate the maximum operating voltage.
- D. All circuits shall be protected against overload and grounded with Ground Fault Circuit Interrupters (GFCI) provided for temporary outlets.
- E. When using permanent power, a GFCI “pigtail” device will be required between the power source and the extension cord.
- F. Flexible temporary cord and light sets shall be hard service or junior hard service usage for construction as specified in NEC Table 400.4.

- G. Non-metallic sheathed cable shall not be used for temporary service on the project.
- H. Temporary power cords of any size shall not be spliced.
- I. Electric wire and flexible cord passing through work areas shall be protected from damage (including that caused by foot traffic, vehicles, sharp corners, protections, and pinching).
- J. Flexible cords and cables passing through holes shall be protected by bushings or fittings.
- K. Temporary electrical distribution systems and devices shall be checked and found acceptable for polarity, ground continuity and ground resistance before initial use and before use after modification.
- L. GFCI's shall be tested monthly.
- M. Temporary power boxes shall be tested monthly and documentation of tests for each box shall be made available upon request.

### 5.22.1 LOCK-OUT PROCEDURES

- A. Due to the scope of this project, the procedures used for energy isolation, be it electrical, mechanical, hydraulic, pneumatic or other types need to be both uniform and coordinated. Therefore, the DIA OCIP has adopted the following procedures which must be communicated to contractors, subcontractors, and employees. Make sure they are aware of, understand, and follow these lock-out procedures and cooperate with other contractors who require a lock-out that involves your work. Note that the DIA OCIP requires the use of lock-out energy isolation devices (that is, using padlocks) throughout this project. Tag-outs (simply tagging the switch, valve, etc.) will not be used unless prior approval is provided by the Program Manager and OCIP Safety Team. A written lockout procedure is required when more than one energy isolating device must be locked out to achieve a zero energy state.
  - 1) Individual Lock-out Procedures – This procedure is used in the event power is either interrupted or restored unexpectedly. If interrupting or restoring power unexpectedly will endanger an employee of any other contractor, including your own subcontractors, use the steps in the *Complex Lock-out Procedures* that follow. Only an authorized employee shall perform all of the following steps:
    - i. Notify all of affected employees of the lock-out and the reason for it.
    - ii. Shutdown the affected equipment in a manner consistent with good operating practices.
    - iii. Verify that the equipment or system is inoperative by trying to operate it, etc.
    - iv. Shutdown the power at the switch, valve, etc., that will be locked. Be absolutely certain the correct device or devices to shutdown and lock were located.
    - v. Safely dissipate any stored energy in pressure lines, flywheels, capacitors, etc., consistent with good operating practices.
    - vi. Lock the switch, valve, etc., using a padlock with only one key. Make sure the company name is on the lock.

- vii. Complete and place on the lock a standard lock-out warning tag indicating what power source was shutdown, the date of the shutdown, authorized employee's name, and the company's name.
  - viii. Verify that the equipment or system is inoperative by trying to start it. (Do not forget to turn all controls back to their off or neutral position).
  - ix. Complete and file on site a Lock-Out Documentation form
  - x. When power is ready to be restored, replace all missing guards. Ensure that no one will be endangered by power restoration prior to removing the lock.
  - xi. After removing the lock, remove and properly destroy the warning tag. (Tags and their attachment devices are not to be reused unless designed for reuse).
- 2) Complex Lock-out Procedures – This procedure must be used when one or more employees of another contractor or subcontractor may be exposed to danger in the event power is either interrupted or restored unexpectedly. Only an authorized employee shall perform all of the following steps as the originator of a complex lock-out. Every affected contractor (including affected subcontractors) is to have an authorized employee to coordinate the lock-out for their company.
- i. Hold a coordination meeting with all affected contractors and subcontractors, of any tier, at least 24 hours in advance of the lock-out. Also, inform the OCIP Safety Team 24 hours in advance. A member of the OCIP Safety Team may wish to attend the meeting or monitor the actual lock-out operations.
  - ii. Notify all affected employees of the lock-out and the reason for it.
  - iii. Shutdown the affected equipment in a manner consistent with good operating practices and have each affected contractor and subcontractor do likewise.
  - iv. Verify that the equipment or system is inoperative by trying to operate it and have each affected contractor and subcontractor do likewise.
  - v. Shutdown the power at the switch, valve, etc., that will be locked. Be absolutely certain the correct device or devices to shutdown and lock were located.
  - vi. Safely dissipate any stored energy in pressure lines, flywheels, capacitors, etc., consistent with good operating practices and, as necessary, have each affected contractor and subcontractor do likewise.
  - vii. Place a chain or lock-out device on the switch, valve, etc., that will be locked.
  - viii. Place a chain or lock-out device using a padlock with only one key. Make sure the company's name is on the lock.
  - ix. Once all the valves and switches are locked out, place all the keys for all the locks in the group lock-out box.
  - x. The authorized employee then places a group lock-out device (Christmas tree) on the hasp and places his lock on the group lock-out device. Each employee must place his/her personal lock, with his or her name on the lock, on the group lock device.

- xi. Complete and place on the lock a standard lock-out warning tag indicating what power source was shutdown, the date of the shutdown, authorized employee's name, and the company's name.
- xii. Verify that the equipment or system is inoperative by trying to start it and have each affected contractor and subcontractor do likewise. (Do not forget to turn all controls back to their *off* or *neutral* position).
- xiii. Complete and file on site a Lock-Out documentation form.
- xiv. When power is ready to be restored, replace all missing guards. Each affected employee must remove their lock when their work is completed. The authorized employee then removes his or her lock and removes the keys from the lock box and begins to restore the equipment to working condition. As the originator of the lock-out, the authorized employee will always remove their lock last. This is only after it has been determined that no one will be endangered by power restoration.
- xv. Restore power.
- xvi. After removing the lock, remove and properly destroy the warning tag. (Tags and their attachment devices are not to be reused unless designed for reuse).

B. General Information

- 1) Padlocks, hasps, tags, and other lock-out devices must be durable enough to withstand the environment to which they will be exposed.
- 2) Locked-out switches, valves, etc., must not be operated regardless of the circumstances.
- 3) Only the employee, who placed the lock on the switch, valve, hasp, etc., can remove it. Anyone who removes or defeats another's lock-out is subject to removal from the project site.
- 4) Locked-out switches, valves, etc. must be inspected at the beginning of each shift to insure that the locks and tags are still in place.

### 5.22.2 ENERGIZED ELECTRICAL WORK

A. This section applies to any contractor/subcontractor who enter or plan work within a Limited Approach Boundary or an Arc Flash Boundary when there are exposed electrical hazards from electrical conductors or circuit parts that are or can become energized. This does not apply to 50 volts or less if there is no increased exposure to electric burns or explosion due to an arc flash. The contractor shall develop an energized work procedure that includes the following guidelines for review by the OCIP Safety Team:

- 1) Energized parts to which personnel might be exposed must be put into an electrically safe work condition and lockout/tagout (LOTO) unless:
  - i. De-energizing the equipment introduces additional or increased hazards;
  - ii. The component is an integral part of a continuous process and would require that the entire process be shut down in order to work on the piece of equipment; or



- iii. Shutdown is infeasible due to equipment design or operational limitations, including the need to perform diagnostics and testing (e.g., start-up or troubleshooting) of electric circuits that can only be performed with the circuit energized.
- 2) Anyone working on or near energized electrical conductors or circuit parts greater than 50 volts must have the following:
  - i. Training – Electrical Safety , NPFA 70E, CPR, LOTO Authorized
  - ii. Authorization – by the contractor , in the case of a subcontractor employee it must be the authorized by the contractor;
  - iii. Permits – An energized work permit or approved equivalent procedure.
- 3) The contractor/subcontractor plans all energized electrical work using an approved electrical work permit .The planning may be as simple as a discussion among the electrical workers reviewing the job, or as complex as a specific procedure with multiple engineering reviews. Planning must include:
  - i. Information about the equipment and the installation;
  - ii. Voltage levels, power availability which might be delivered into an arc flash;
  - iii. The Flash Hazard/Risk Category for arc-flash rating of the PPE (cal/cm2);
  - iv. Any additional requirements necessary to perform the work, including, if required, additional training.
  - v. Applicability of the two-person rule. **Two Person Rule.** A second qualified person, knowledgeable in rescue techniques to the level taught in Electrical Safety, NFPA 70E and CPR qualified, is required when ANY of the following criteria exists:
    - a. Performing work within the Arc-Flash Boundary of exposed live parts that has an arc-flash Hazard/Risk Category of 3 or 4;
    - b. Operating switches or breakers with an arc-flash Hazard/Risk Category of 4;
    - c. Any time there are exposed live parts with >250V but <600V and when either of the following exists:
      - 1. A barricade is not established;
      - 2. When performing tasks where there are multiple sources of exposed live parts with voltage >50V (e.g., multiple terminal strips, including some control panels and power supplies). Examples:
        - a) Two persons NOT required: Hazard Risk Category is less than 3 AND a single source of exposed voltage, such as a manually operated disconnect switch. (One set of 3 phase connections is considered a single source.)
        - b) Two persons required: Multiple sources of exposed voltage, such as a control panel with 480V exposed terminal lugs and 120V control terminals, regardless of which one is being worked on.
        - c) Any time work planning, including worker-planned work, determines the need for two-persons to perform a given task. The second person must wear the appropriate PPE if assisting the primary worker in the same control zone. Note: The second person may operate breakers



and switches without an additional second person if an emergency should arise.

4. The contractor must review permits and ensure that all personnel working under the permit:
  - i. Are qualified for the type and energy levels on the permit;
  - ii. Have signed the permit;
  - iii. Maintain currency of training
  - iv. Receive a pre-task planning briefing and understand the hazards associated with this task by discussing the following during JHA development:
    - a. Limits of the permit, especially limits of only testing with TTVM permit;
    - b. PPE for various tasks;
    - c. Any job specific or general work practices to be observed.
5. The Contractor issuing the work permits for employees or subcontractors must sign the permit and ensures that:
  - i. A log is kept for auditing purposes.
  - ii. Periodic walkthroughs or field checks are conducted to verify the following:
    - a. Workers are qualified;
    - b. Compliance with procedure or permit;
    - c. Proper PPE
6. The contractor/subcontractor employee who performs the energized work must do the following:
  - i. Prior to starting work:
    - a. Review the work plan/permit and inform those involved with the work and those nearby who could be impacted that work will begin.
    - b. Establish safety barriers to keep unprotected personnel out of the arc flash control zone and shock hazard control zones.
  - ii. While performing the work:
    - a. Perform the work in accordance with conditions on the permit and with procedures;
    - b. Perform any necessary testing.
  - iii. After completing the work:
    - a. Replace any physical barriers which were removed in order to do the work;
    - b. Inform those involved and those nearby who could have been impacted that the work has been completed and conditions are safe;
    - c. Remove the safety barriers and all tools, equipment, and scrap.

## 5.23 SILICA

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- A. Contractors and/or subcontractors shall submit a written silica protection program for review by the OCIP Safety Team. The requirements for managing silica dust shall be followed and included in the written plan by utilizing the Federal OSHA Publication #3362-04 2009, titled, "Controlling Silica Dust Exposures".

### 5.23.1 *POTENTIAL EXPOSURES*

- A. The following activities may cause crystalline silica dust to be present in the air:
  - 1) Sawing, hammering, cutting, drilling, grinding, and chipping of concrete or masonry
  - 2) Chipping, hammering, and drilling rock
  - 3) Dry sweeping or pressurized air blowing of concrete, rock, or sand dust
  - 4) Crushing, loading, hauling, and dumping rock
  - 5) Sandblasting
  - 6) Demolition of concrete and masonry structures
  - 7) Concrete mixing
  - 8) Working with ceramics, clay, and pottery

### 5.23.2 *GENERAL GUIDELINES FOR WRITTEN PROGRAM*

- A. Statement of the Contractor's commitment to prevent silicosis and to comply with OSHA's standards.
- B. Description of air monitoring to determine the silica levels generated by tasks to provide a basis for:
  - 1) Selecting engineering controls,
  - 2) Selecting respiratory protection,
  - 3) Selecting work practices to reduce dust, and
  - 4) Determining if a medical surveillance program is necessary.
- C. Description of engineering controls which are proposed for the project to eliminate or reduce the amount of silica in the air and the build-up of dust on equipment and surfaces.
- D. Description of less hazardous materials than crystalline silica which are proposed for abrasive blasting and automatic blast cleaning machines or tools to be utilized.
- E. Description of high-efficiency particulate air filter vacuums to be used by employees and work practices to vacuum, hose down, or wet clean work areas and equipment.
- F. Description of warning signs and other barriers proposed to identify work areas where respirable silica may be present and to limit access to only authorized employees.
- G. Description of personal protective equipment and clothing to be provided to employees and changing facilities if necessitated by the level of silica dust exposure.
- H. Certification of training provided to employees about health effects of silica exposure, engineering controls and work practices that reduce dust, the importance of maintenance and good housekeeping, as well as the proper type and fitting of respirators; and include a statement that the employee is or is not enrolled in a medical surveillance program.

### 5.23.3 *AIR MONITORING*

- A. The contractor will inspect each work operation to determine if employees are exposed to silica above the PEL. Indicators that an evaluation of employee exposure should be undertaken include:

- 1) Information or observation which would indicate employee exposure to silica.
  - 2) Employee complaint of symptoms which may be attributed to exposure to silica.
  - 3) Change which may result in an increase in the airborne concentration of silica.
- B. The contractor will conduct air monitoring to measure worker exposures and ensure that engineering controls and respiratory protection are providing adequate protection.
  - C. Air monitoring information will be made available to workers and OCIP Safety Team
  - D. If employees are exposed to silica in excess of the PEL, monitoring will be repeated quarterly.

#### 5.23.4 SAFE WORK PRACTICES

- A. The primary means of protecting workers will be through the use of less toxic materials, enclosed systems, local exhaust ventilation, wet methods, and good work practices.
- B. The following measures will be used to reduce exposure to crystalline silica in the workplace:
  - 1) Wet down the dust at the point of generation.
  - 2) Install local exhaust ventilation to prevent dust from being released into the air.
  - 3) During rock drilling, flow water through the drill stem.
  - 4) Install dust collection systems onto machines or equipment that generated dust.
  - 5) Use concrete/masonry saws that provide water to the blade. Water may be used to suppress dust produced by pneumatic, hydraulic, or gasoline-powered saws. Water is typically applied to the blade through one or two nozzles to suppress dust emissions. Water may be supplied from a portable pressurized tank or a hose. The recommended flow rate is 0.5 liters (17 ounces) of water per minute to suppress dust. Less water will not be as effective.
  - 6) When using vacuum cleaners, the vacuum should have the following features:
    - i. Sufficient flow rate to capture the dust and transport it to the vacuum source. One study showed that an air flow rate of 70 cubic feet per minute (cfm) was required to achieve effective dust control.
    - ii. High-efficiency particulate air (HEPA) filter to reduce the chances of releasing dust containing RCS from the vacuum into the worksite.
    - iii. A pre-filter or cyclone to increase the length of service of the HEPA filter.
    - iv. A filter replacement indicator, such as a pressure gauge. If the vacuum cleaner does not have a pressure gauge, workers can monitor the air flow by checking to see if a dust plume is escaping from around the shroud.
    - v. The ability to clean and replace filters and full collection bowls or bags without exposing the operators to dust.
    - vi. A motor that draws at least 10 amps.
- C. Silica sand or other substances containing more than 1% crystalline silica will not be used for abrasive blasting.
- D. Good personal hygiene will be practiced to avoid unnecessary exposure. Eating, drinking, use of tobacco products, or applying cosmetics will not be done in areas where there is dust containing crystalline silica.

- E. If possible, employees will shower and change into clean clothes before leaving the worksite to prevent contamination of cars, homes, and other work areas.

## 5.24 POWDER ACTUATED TOOLS

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- A. Contractors/Subcontractors, of any tier, shall ensure that employees using powder actuated tools be certified by the manufacturer's representative prior to use.
- B. Certification cards must be available for immediate inspection if requested.
- C. Contractors/Subcontractors using powder actuated tools shall ensure that all cartridges, whether used, not used or misfired, have been picked up and removed from the work area.
- D. Signs shall be posted in areas where powder actuated tools are in use.
- E. Powder actuated tools shall not be left unattended while loaded. If found unattended and loaded, the operator shall be subject to removal from the project.
- F. The use hardhat, safety glasses, full face shield and hearing protection shall be used while operating a powder actuated tool.

## 5.25 STEEL ERECTION

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- A. Steel erection requires compliance with the following:
  - 1) 100% fall protection provisions, such as lifeline attachments, dynamic fall restraints and other such devices shall be considered during shop drawing preparation and incorporated into fabricated pieces.
    - i. The use of a Controlled Decking Zone (CDZ) is not permitted to be used as a primary fall protection method. CDZ can be used in combination with conventional fall protection methods (PFAS)
  - 2) Lifelines or other fall protection devices shall be attached prior to erection where possible.
  - 3) Employees of contractors and subcontractors, of any tier, must comply with the fall protection requirements covered earlier in this section.
  - 4) The running length of wire rope protection, when used for perimeter protection, shall not exceed two bay widths or 24 feet, and will be equipped with support stanchions every 8 feet to maintain the required deflection.
  - 5) A turnbuckle may be installed for maintenance of the perimeter protection to keep tight: a minimum of 3 Crosby clamps will be installed and torqued to specification. The use of lap joints is prohibited.
  - 6) When Christmas Treeing, only 3 pieces shall be allowed and a multiple lift rigging assembly shall be used.
  - 7) The contractor shall not erect steel unless it has received written notification that the concrete in the footings, piers and walls or the mortar in masonry piers and walls has attained, on the basis of an appropriate ASTM standard test method of field-cured samples, either 75 percent of the intended minimum compressive design strength or sufficient strength to support the loads imposed during steel erection.

- 8) Pre-planning shall be conducted and documented for landing deck bundles and installing the perimeter protection for interior/exterior fall hazards.
- 9) All columns shall be anchored by a minimum of 4 anchor rods (anchor bolts).
- 10) All columns shall be evaluated by a competent person to determine whether guying or bracing is needed; if guying or bracing is needed, it shall be installed.
- 11) Anchor rods (anchor bolts) shall not be repaired, replaced or field-modified without the approval of the project structural engineer of record. Prior to the erection of a column, the contractor shall provide written notification to the steel erector if there has been any repair, replacement or modification of the anchor rods (anchor bolts) of that column.
- 12) Conduct and document appropriate pre-task planning and a job hazard analysis for all steel erection. Keep this documentation on site for review by the OCIP Safety Team.

## 5.26 *WELDING AND CUTTING*

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- A. Recommended and required (where indicated) safe practices:
  - 1) A welder should wear inflammable clothing and protective gear to shield their entire body using the following examples:
    - i. Aprons that are made from leather that is flame-resistant
    - ii. Safety steel-toed boots, preferably high-top ones because low-cut boots and shoes put you at a higher risk of catching slag that is hot. (Required)
    - iii. Helmets or any other head gear to protect you from sharp and falling objects. (Required)
    - iv. Goggles or helmets to protect your eyes from the transmission of radiant energy being emitted by the welding tool. (Required)
    - v. Optional earplugs or earmuffs if you are working with anything noisy or in environments that have a high level of noise; and
    - vi. Respirators to prevent inhalation of hazardous fumes, dust and gases because if you breathe in too much of those, they can definitely damage your lungs and give you a hard time breathing.
    - vii. Greater protection can be obtained from reflection under the face shield if clothing with the dark colors are worn. Clothing made of wool is also preferred over clothing made of cotton because wool can resist deterioration better than cotton. Pants should not have pockets on the front that may catch sparks.
- B. See additional requirements in Division 1 – Section 01010 and 01060

### 5.26.1 *ELECTRIC ARC WELDING*

- A. Screens, shields, or other safeguards should be provided for the protection of men or materials, below or otherwise exposed to sparks, slag, falling objects, or the direct rays of the arc.

- B. The welder shall wear approved eye and head protection. Workers assisting the welder shall also wear protective glasses, head protection and protective clothing.
- C. Adequate exhaust ventilation shall be maintained at all welding and cutting work areas.
- D. Electric welding equipment, including cables, shall meet the requirements of the National Electric Code.
- E. All arc welding and cutting cables shall be of the completely insulated flexible type capable of handling the maximum current requirements of the work.
- F. Cables in need of repair shall not be used.
- G. Welding leads shall not be repaired with tape or by any other means.
- H. Leads shall be inspected before each use, leads in need of repair will be tagged “do not use” and taken off the project site at the end of the day’s work shift.
- I. The frames of all arc welding and cutting machines shall be grounded either through a third wire in the cable connecting the circuit connector or through a separate wire which is grounded at the source of the current. All ground connections shall be inspected to insure that they are mechanically strong and electrically adequate for the required current.
- J. Welding practices shall comply with all applicable regulations.

### 5.26.2 GAS WELDING OR CUTTING

- A. All hose used for carrying acetylene, oxygen or other fuel gas shall be inspected at the beginning of each working shift. Defective hose shall be removed from service.
- B. Oxygen cylinders and fittings shall be kept away from oil and grease. Oxygen shall not be directed at oily surfaces, greasy clothes or hands.
- C. Regulators, gauges, backflow check valves, and torches shall be kept in proper working order.
- D. Appropriate personal protective equipment, such as burning glasses, shields, and/or gloves shall be used. Adequate exhaust ventilation shall be maintained at all welding and cutting work areas.
- E. All oxygen/acetylene setups shall have a “flashback” arrestor check valve at the regulators, not at the torch head.
- F. Check valves shall be tested for proper function at least every six months and documentation of the test shall be readily available upon request.

### 5.27 COMPRESSED GAS CYLINDERS

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- A. When gas cylinders are stored, moved, or transported, the valve protection cap shall be in place.
- B. When cylinders are hoisted, they shall be secured in an approved cage or basket. The valve cap shall never be used for hoisting. All cylinders shall be stored, transported, and used in an upright position. If the cylinder is not equipped with a valve wheel, a key shall be kept on the valve stem while in use.
- C. Cylinders should be transported using hand trucks designed for that purpose.

- D. Gas cylinders shall be properly secured at all times to prevent tipping, falling or rolling. They can be secured with straps or chains connected to a wall bracket or other fixed surface, or by use of a cylinder stand.
- E. Oxygen cylinders (empty or full) in storage should be separated from fuel-gas cylinders and combustible materials by a minimum distance of 20 feet or by a barrier at least 5 feet high having a fire-resistance rating of at least one-half hour.
- F. Full and empty cylinders of all gases should be stored separately and identified by signs to prevent confusion.
- G. Close valves on empty cylinders and mark the cylinder "empty" with the initials "M.T."
- H. At the end of each work day or if work is suspended for a substantial period of time, compressed gas cylinder valves shall be closed, regulators removed and properly stored.
- I. Cylinders containing oxygen or acetylene or other fuel gas shall not be taken into confined spaces.
- J. Cylinders containing oxygen or acetylene or other fuel gas shall be stored in designated areas outside the structure.
- K. No one shall use a cylinder's contents for purposes other than those intended by the supplier.
- L. Always use the proper regulator for the gas in the cylinder. Always check the regulator before attaching it to a cylinder. If the connections do not fit together readily, the wrong regulator is being used.
- M. Before attaching cylinders to a connection, be sure that the threads on the cylinder and the connection mate are of a type intended for the gas service.
- N. Do not permit oil or grease to come in contact with cylinders or their valves.
- O. Wipe the outlet with a clean, dry, lint-free cloth before attaching connections or regulators. The threads and mating surfaces of the regulator and hose connections should be cleaned before the regulator is attached.
- P. Attach the regulator securely before opening the valve wide. Always use a cylinder wrench or another tightly fitting wrench to tighten the regulator nut and hose connections.
- Q. Open cylinder valves SLOWLY. Do not use a wrench to open or close a hand wheel type cylinder valve. If it cannot be operated by hand, the valve should be repaired.
- R. Stand to the side of the regulator when opening the cylinder valve.
- S. Do not attempt to repair cylinder valves or their relief devices while a cylinder contains gas pressure. Tag leaking cylinders or cylinders with stuck valves and move to a safe, secure outdoor location.

## 5.28 *HOT WORK PERMITS*

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- A. Hot work operations include tasks such as welding, brazing, torch cutting, grinding, and torch soldering. These operations create heat, sparks and hot slag that have the potential to ignite flammable and combustible materials in the area surrounding hot work activities. The contractor will develop and submit a hot work permit procedure as part of the SSSP and include the provisions in 5.28.1.

- B. Contractors will need to obtain annually a hot work permit from the Denver Fire Department.

### 5.28.1 GENERAL GUIDELINES

- A. Work should be performed using alternative methods other than hot work whenever possible.
- B. Hot work should be performed in designated hot work rooms whenever it is practical.
- C. A Hot Work Permit is valid for one day and one area and shall be posted in the area of hot work for the duration of the activity. See Appendix P for Sample Hot Work Permit
- D. A copy of every permit shall be maintained onsite and readily available for review.
- E. Hot Work Permit and must be posted in the area where hot work is to be performed.
- F. Employees who perform hot work operations must always obtain a Hot Work Permit before beginning hot work.
- G. A Fire Watch is posted to monitor the safety of hot work operations and watch for fires.
- H. Fire Watches are posted if the situation requires one, during hot work, and for at least 30 minutes after work has been completed. Any employee who has successfully completed hot work safety training can serve as the Fire Watch.
- I. All flammable and combustible materials within a 35-foot radius of hot work must be removed.
  - 1) When flammable and combustible materials within a 35-foot radius of hot work cannot be removed they must be covered with flame retardant tarps and a fire watch must be posted.
- J. Floors and surfaces within a 35-foot radius of the hot work area must be swept free of combustible dust or debris.
- K. All openings or cracks in the walls, floors, or ducts that are potential travel passages for sparks, heat and flames must be covered.
- L. Two fire extinguishers (minimum 10 lbs. each) of the appropriate type must be readily available and accessible with at least one being within reach of the worker performing the welding, cutting or brazing activity.
- M. Entire building smoke detection and alarms systems may not be shut down. Instead smoke detectors in the area of hot work may be covered for the duration of hot work to prevent false alarms.
- N. Automatic sprinkler systems may not be shut down to perform hot work. Instead, individual sprinkler heads in the area of hot work may be covered with a wet rag to prevent accidental activation.

### 5.29 FIRE PREVENTION AND PROTECTION

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- A. Open fires are prohibited.
- B. Subcontractors performing torch-applied roofing operations must submit NRCA (National Roofing Construction Manager Association)-recognized CERTA (Certified Roofing Torch Applicator) training documentation for each of their personnel involved in such operations prior to those personnel commencing work on the project.



- C. Locations for storage of all fuels, lubricants, starting fluids, etc., shall be reviewed by Program Manager prior to use by Contractor for storage and shall conform to the requirements of the NFPA as well as the local Fire Marshal. Plastic containers are not permitted per OSHA specification.
- D. Storage of fuels shall be away from ignition sources
- E. Only containers approved by Underwriters Laboratories, Factory Mutual or DOT, and clearly labeled to identify contents shall be used for transporting or storing flammable or combustible liquids. Metal safety cans with self-closing spouts and flash arresters are required for the storage, handling, and transporting of flammable and combustible liquids.
- F. Smoking is not permitted within building structures or work areas.
- G. Flammable or combustible liquids or gases shall not be stored inside any building unless approved by the Program Manager in writing. When indoor storage is approved by the Program Manager in writing, such storage shall comply at a minimum with OSHA 1926.152 and NFPA requirements. Storage is defined as maintaining quantities in excess of what can be used in the course of normal work during the intended shift.
- H. Vessels or tanks containing flammable or combustible liquids or gases shall be placed in a fuel storage area designated by the contractor. This area will be located a minimum distance from buildings, construction equipment, parking lots, etc. to minimize the exposure to a fire involving the tank. The contractor shall meet local, state, and federal safety requirements when placing vessels or tanks. Such locations will be equipped with substantial barricades or bollards to prevent vehicles and equipment from striking the vessels or tanks. This is also required of any fuel container that provides temporary heat for a structure.
- I. Flammable or combustible liquids or gases shall not be stored on roofs when not in use including after work shifts.
- J. Storage tanks shall be equipped with self-closing dispensing nozzles and shall be provided with atmospheric and emergency relief vents equipped with flame arresters.
- K. Tanks or drums from which flammable liquids are dispensed shall be electrically grounded and shall be equipped with bonding wire to complete the grounding with the vessel into which the liquid is dispensed.
- L. There shall be no smoking or open flame in flammable or combustible liquid or gas storage areas. Conspicuous and legible signs prohibiting smoking shall be posted by the contractor.
- M. The contractor will provide portable, dry chemical fire extinguishers (minimum 20 pound ABC) for the fuel storage areas.
- N. Portable fire extinguishers suitable for the potential hazard shall be provided by each contractor for their equipment, office area, and work activities. A fire extinguisher must be in the immediate work area when any spark or open flame producing work is taking place. The contractor shall be responsible for general area fire extinguisher placement and maintenance until the building is turned over to the Owner. In addition, the contractor shall have on site personnel trained in the proper use of fire extinguishers.
- O. Any work involving or producing spark, open flame, arc or heat requires a hot work permit.
- P. The contractor shall be responsible for ensuring the removal (protection when removal is not feasible) of all combustible or flammable materials in the area, and shall provide appropriate fire extinguishers and fire watch as required by the work.

- Q. In order to summon fire fighting assistance, call 303-342-4211. Immediately report all fires (even those that have been extinguished) to the OCIP Safety Team.
- R. Replace or recharge temporary fire fighting and fire protection equipment immediately after use. Also report to the OCIP Safety Team (within eight hours) any discharge of firefighting equipment.

### 5.30 **SMOKING**

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- A. The primary purpose of this policy is the establishment of a completely smoke-free environment in the work place in order to protect life, health and property.
- B. Program Manager, Contractor, Subcontractor employees and visitors are not permitted to smoke in any buildings on DIA property. Employees and visitors may smoke at designated smoking areas on site.
- C. At each construction jobsite, the contractor will designate a smoking area for Contractor and Subcontractor employees. The area will include but will not be limited to the following conditions:
  - 1) Smoking will be permitted only at designated smoking areas, at least 100 feet from work areas.
  - 2) Designated smoking areas must have a "Smoking" sign that indicates the designated smoking area. A cigarette butt container with sand must be available to extinguish smoking materials. Cigarette butts will not be permitted to be discarded on the ground, roadway, or work area.
  - 3) A charged, 20# ABC fire extinguisher must be available at the designated smoking area. The fire extinguisher must be within 25 feet traveling distance in any direction of the designated smoking area.
  - 4) Contractor and Subcontractor employees must be trained in the proper use of fire extinguishers.
  - 5) No smoking is permitted within 100 feet of flammable liquids, approved flammable liquid containers, and flammable materials.
  - 6) No smoking is permitted within 100 feet of storage and/or in use flammable compressed gas cylinders, or gas cylinders that support combustion.
  - 7) No smoking is permitted within 100 feet of combustible materials.
  - 8) Positively "NO SMOKING" is permitted within 100 feet of a gas pump area.
- D. Smoking is not permitted in the immediate work area to include onsite vehicles and equipment.
- E. The Program Manager reserves the right to designate specific smoking areas at its discretion.

### 5.31 **SECURITY**

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#### 5.31.1 **CONSTRUCTION SITE SECURITY**

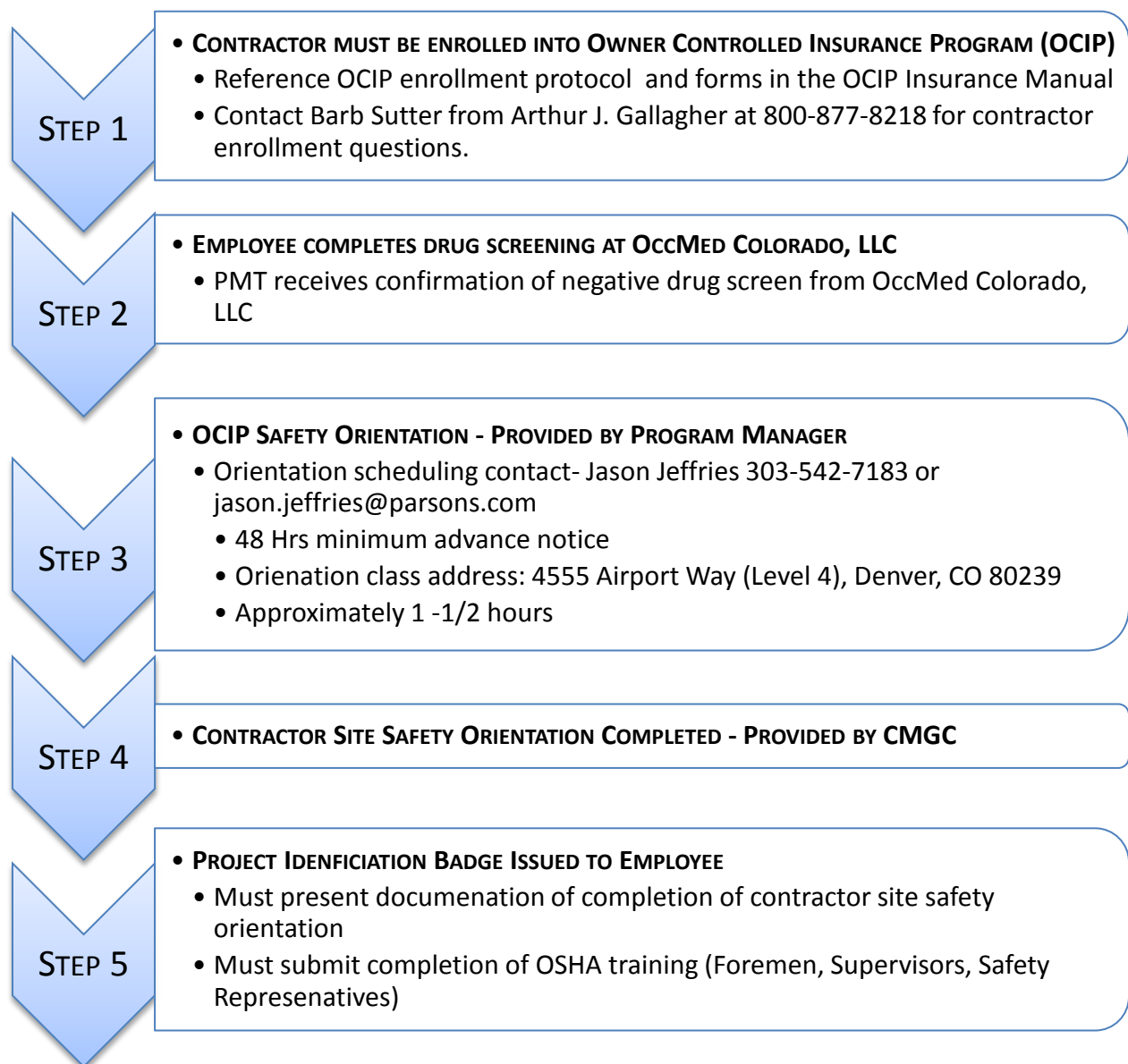
- A. DIA will provide security service for this project. This service in no way relieves the contractor/subcontractors from contractual duties, obligations, and responsibilities to

ensure that their trailers, vans, vehicles, equipment, tools, storage areas, etc. are properly secured at the end of each working day.

- 1) Report unauthorized people, vehicles, suspicious behaviors, unattended packages, etc. to Denver International Airport Security at 303-342-4211.

### 5.31.2 PROJECT IDENTIFICATION BADGES

- A. All employees working for contractors who are required to be enrolled in the OCIP will receive a project identification badge.
- B. Project identification badges are obtained as follows:



### 5.31.3 VEHICLE SEARCH

- A. All vehicles will be subject to search upon entering and exiting the construction site and designated parking areas. Any unauthorized vehicle parked on the project site (other than in designated parking areas) may be physically removed at the expense of the vehicle owner.

### 5.31.4 TOUR & VISITOR GUIDELINES

- A. Escorted Visitors
  - 1) Non-construction personnel, visitors or groups shall be accompanied at all times by an authorized representative of the Program Manager or the contractor, or other designee that is familiar with the site hazards and properly badged on the project.
    - i. The “Waiver and Release” provided in Appendix I shall be signed by all visitors/tour groups prior to accessing the project.
    - ii. Display a visitor’s site badge on the outer garment at all times,
    - iii. Don the required PPE (Contractor visitors/tours are responsible to provide the appropriate PPE).
- B. Notification
  - 1) Tours that do not involve technical inspections shall be cleared 7 days in advance through the Program Manager.
- C. Safety Enforcement
  - 1) Before entering the project, all visitors shall be receive a brief safety orientation on site specific hazards expected to be encountered during the tour or visit to including but not limited to things such as holes, trip hazards, potentially open electrical wiring, nails, exposed rebar, partially completed framing, excessive noise, vibration, hazards from falling objects, project signage, moving equipment, these and other conditions present hazards, dangers and risks of potential injury, illness and/or property damage.
- D. Number of Escorted Persons
  - 1) The number of escorted persons on tours should be proportionate to the degree of the hazards and operating space involved, but may not exceed ten (10) visitors per authorized group representative.

### 5.31.5 LOITERING ON THE JOB

- A. Loitering on the job site before or after the assigned shift is prohibited.

### 5.32 GENERAL RULES

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- A. Good conduct is essential to the common good of all employees and the speedy progress of the job. Undesirable conduct including, but not limited to the following will not be tolerated and employees will be subject to removal from project:
  - 1) Unauthorized possession of any project property or material
  - 2) Possession of or use of intoxicants on premises, regardless of source
  - 3) Engaging in disorderly conduct
  - 4) Gambling, including sale of chances
  - 5) Fighting on project premises
  - 6) Failure to wear or use required safety equipment
  - 7) Failure to observe safety, sanitary or medical rules and practices
  - 8) Illegal possession or use of narcotics or non-prescribed tranquilizers or pep pills on premises, or attempting to bring them on job site
  - 9) Possession or use of firearms, weapons, or explosives is expressly prohibited on the project premises
  - 10) Willful defacing or damaging of equipment, tools, material or other property of the project or contractors.
  - 11) Offensive language is prohibited.
- B. Contractor and subcontractor employees are required to report unsafe behaviors and conditions to their supervisor. When possible, employees shall correct hazards immediately. Employees should look out for their fellow worker and advise them to work safely, assisting them if necessary. Employee suggestions for improved safety performance are encouraged.

### 5.33 TRAFFIC CONTROL

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- A. All work shall be planned well in advance to keep traffic obstructions, public inconvenience and lost work time to a minimum. Therefore, a traffic plan shall be developed in accordance with the Colorado Department of Transportation and the Manual of Uniform Traffic Control Devices (MUTCD) and submitted for review and comment to the Program Manager, OCIP Safety Team and Denver International Airport Maintenance Section (Ron Morin) prior to the work to be performed. The plan shall include:
  - 1) Traffic conditions;
  - 2) Existing traffic controls;
  - 3) Physical features;
  - 4) Visibility restrictions;
  - 5) Problems of access to private property;
  - 6) Business access and activities;
  - 7) The type, number and location of signs, barricades, lights and other traffic devices required for the work; and
  - 8) Means of mitigating any adverse effect upon the blind or other physically handicapped.

B. Flaggers are required:

- 1) Where workers or equipment intermittently block a traffic lane;
- 2) Where plans or permit allow the use of one lane for two directions of traffic (one person is required to direct vehicles for each direction of traffic); and
- 3) Where the safety of the public and/or workers determines there is a need.
- 4) All flaggers are to be certified to perform this duty.

### 5.34 *PROTECTION OF THE PUBLIC AND PROPERTY*

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A. The Contractor and Subcontractors shall take the necessary precautions to protect the general public (individuals not contractile related to the project(s)) from injury or damage to property and shall follow the contract requirements. The precautions to be taken shall at a minimum are as follows:

- 1) Perform no work in any area occupied or in use by the public unless specifically permitted by the contract or in writing from Program Manager.
- 2) Maintain work areas where public use may be necessary, especially involving sidewalks, entrances to buildings, lobbies, corridors, aisles, stairways, and vehicular roadways. Protect the public with appropriate guardrails, barricades, temporary fences, overhead protection, temporary partitions, shields, and adequate visibility. Such protection shall guard against harmful radioactive rays or particles, flying materials, falling or moving materials and equipment, hot or poisonous materials, explosives and explosive atmospheres, flammable or toxic liquids and gases, open flames, energized electric circuits, or other harmful exposures.
- 3) Keep sidewalks, entrances to buildings, lobbies, corridors, aisles, doors, or exits that remain in use by the public clear of obstructions to permit safe ingress and egress of the public at all times.
- 4) Appropriate warning signs and instructional safety signs shall be posted where necessary. In addition, a signalman shall control the movement of motorized equipment in areas where the public might be endangered.
- 5) Provide sidewalk sheds, canopies, catch platforms, and appropriate fences when it is necessary to maintain public pedestrian traffic adjacent to the erection, or structural alternation of outside walls on any structure.
- 6) Provide temporary fences around the perimeter of above ground operations adjacent to public areas except where a sidewalk shed or fence is provided by the contract or as required (2) above. Perimeter fences shall be at least six (6) feet high. They may be constructed of wood or metal frame and sheathing, wire mesh or a combination of both. When the fence is adjacent to a sidewalk near a street intersection, at least the upper section of the fence shall be open wire mesh from a point not over four (4) feet above the sidewalk and extending at least twenty-five (25) feet in both directions from the corner of the fence or otherwise required by Denver International Airport.
- 7) Provide warning signs and lights, including electric lights during periods of severely restricted visibility, and continuously from dusk to sunrise along the guardrails, barricades, temporary sidewalks, and at every obstruction to the public as needed.

- They shall be placed at both ends of such protection or obstructions and not over twenty (20) feet apart alongside of such protection or obstruction.
- 8) Provide temporary sidewalks when a permanent sidewalk is obstructed by the operations. They shall be in accordance with the requirements of the local ordinances. Guardrails shall be provided on both sides of temporary sidewalks.
  - 9) Provide guardrails on each side of vehicular and pedestrian bridges, ramps, runways, and platforms. Pedestrian walkways elevated above adjoining surfaces, or walkways within six (6) feet of the top of excavated slopes or vertical banks shall be protected with guardrails, except where sidewalk sheds or fences are provided. Guardrails shall be made of rigid materials capable of withstanding a force of at least two hundred (200) pounds applied in any direction at any point in their structure. Their height shall be approximately forty-two (42 + or - 3) inches. Top rails and posts may be two inches by four inches (2 x 4) dressed wood or equal materials. Posts shall not be more than eight (8) feet apart.
  - 10) Provide barricades where sidewalk sheds fences or guardrails as referenced above are not required between work areas and pedestrian walkways, roadways or occupied buildings. Barricades shall be secured against accidental displacement and shall be maintained in place except where temporary removal is necessary to perform the work. When a barricade is temporarily removed, a watchman shall be placed at all openings.
  - 11) Prohibit fuel-burning types of lanterns, torches, flares or other open flame devices.
  - 12) Maintain all equipment, devices and structures so as to not pose a hazard to the public, property or employees, and to perform their intended functions properly at all times.
  - 13) Each point of access to the project will be controlled.

### 5.35 *HEAT ILLNESS PREVENTION*

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- A. The OCIP recognizes that during certain times of the year employees may be exposed to working in excessive temperatures which may create the risk of heat stress and illness. Acknowledging this exposure, contractors/subcontractors are required to establish a Heat Illness Prevention Plan to educate and monitor employees for heat-related illness.
- B. At a minimum, the Heat Illness Prevention Plan is to contain the elements listed below and submitted as part of the SSSP for review by the OCIP Safety Team. See sample heat illness plan in Appendix J
  - 1) Training
  - 2) Water
  - 3) Shade
  - 4) Monitoring the Weather
  - 5) High Heat Procedures & Acclimatization
  - 6) Clothing
  - 7) Emergency Response

### 5.36 *CRISIS COMMUNICATIONS PLAN*

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- A. Contingency planning for crisis and emergency situations is accepted as good management practice and by accepting this fact, anticipating certain crisis scenarios management will minimize the potential damage from critical situations. Proposed work flow process that details the general crisis communications on the program. All steps in the crisis communication process will be done in consultation with DIA. DIA, unless otherwise identified, will be responsible for crisis communications. Each contractor on the program is expected to have a component in the crisis communication plan that addresses the following:
  - 1) Ensuring accurate and timely information is disseminated to both internal and external audiences
  - 2) Preparing DIA, Program and Contractor staff to respond in a crisis by identifying roles and responsibilities
  - 3) Coordinating effectively with existing DIA protocol and when necessary impacted agencies
- B. The plan shall also include information on:
  - 1) Crisis Communications Operations
  - 2) Crisis Communications Center
  - 3) Crisis Communications Team
  - 4) Roles and Responsibilities
  - 5) Emergency Contact Phone Tree
  - 6) Crisis Tasks
  - 7) Media Briefing
  - 8) On Site Crew Response
  - 9) Crisis Communications Tools
  - 10) Crisis Communication Workflow (see Appendix K)
- C. The Program Management Team Strategic Communications Lead, in coordination with Contractors (if necessary), under the direction of DIA Director of Communications will:
  - 1) Trigger the phone tree to notify the Crisis Communications Team that the Crisis Communications Center has been activated.
  - 2) Gather situation facts: What, Where, When, Impacts (program/human/traffic/utilities/etc.), Injuries/Fatalities, Who (at the scene, overall, program/emergency responders).
  - 3) Determine lead internal/external agency and spokesperson/media control persons for media/public response. Default assignment is for DIA to serve in this capacity.
  - 4) Make assignments and pass out contact lists as team members arrive.
  - 5) DIA review/approves crisis communications approach.
  - 6) Each liaison follows job description as appropriate.
  - 7) Dispatch spokesperson and media control person to site if necessary.
  - 8) Determine necessity of Web site updates and/or reverse 911 phone systems and activate (business/community liaison role).
  - 9) Develop official statements for the media and other applicable response agencies. Staff will issue bulletin regarding response to the incident/crisis.



- 10) Develop messages and possible Q&A.
- 11) Monitor media coverage.
- 12) If appropriate, establish Media Briefing Center and staff with second medial control person.
- 13) Track contacts and provide information to media, internal, government, business and community phone inquiries.
- 14) Maintain contact lists and make update calls.
- 15) Assist media in obtaining information/video/photos in safe manner.
- 16) Arrange follow-up interviews as appropriate.
- 17) Communicate with Program Management as to appropriate internal communication with employees, family members, etc.
- 18) Hold debrief sessions with crisis team as needed.

### 5.37 *JOBSITE SAFETY INSPECTIONS*

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- A. The contractor's safety representative will conduct and document daily jobsite inspections of work site to evaluate compliance with SSSP, OCIP Safety Manual and identify, correct jobsite hazards. Inspection reports must be documented daily and be made available to OCIP Safety Team for review.
  - 1) A member of the contractor's management group (Project Manager, Field Supervisor, Foreperson, etc.) must attend and participate in at least one jobsite inspection per week. Attendance must be documented on the inspection log.
  - 2) Contractor may be directed to use a software program or Software-as-a-Service (SaaS) solution that will enable Contractor and Program Manger to perform jobsite safety audits and measure the effectiveness of their safety programs.

## **SECTION 6. REQUIRED SAFETY TRAINING**

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### **6.0 NEW EMPLOYEE ORIENTATION PROVIDED BY PROGRAM MANAGER**

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- A. OCIP Safety Orientation shall be given to all new employees once the employee has successfully completed the substance abuse drug screen and before they can begin work. The orientation shall be general in format, addressing the safety rules and regulations of the OCIP such as but not limited to as conditions of employment:
  - 1) Safety goals of the OCIP
  - 2) PPE & work attire
  - 3) Drug and Alcohol Policy
  - 4) Accident and incident reporting
  - 5) Personal conduct and disciplinary actions
  - 6) Authorized access & parking
  - 7) Site badge and identification
  - 8) Housekeeping, litter and use of sanitary facilities
  - 9) Any other special provisions
- B. The new employee orientation provided by the program manager will be followed by a simple quiz that the worker must pass by a minimum of 70% and acknowledge that they understand the rules and regulations of the project.
- C. A minimum of 7 days advance notice is required to schedule orientation provided by PMT.
- D. Contact Jason Jeffries to schedule OCIP orientation training dates at (303)542-7183.

### **6.1 NEW EMPLOYEE ORIENTATION TRAINING PROVIDED BY THE CONTRACTOR**

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- A. One of the requirements of the contractor and their safety representatives or designees is to conduct a complete safety orientation for all their employees and subcontractor employees new to the site. The orientation is required before an employee can receive a project ID card and enter the construction area. The purpose of the orientation is to provide employees an awareness of what they can expect and what is expected of them on site. At a minimum, the orientation will include:
  - 1) Employee jobsite safety and health requirements and policies
  - 2) Review of site specific safety plan to include emergency procedures/phone numbers and Crisis Management Plan
  - 3) Employer and employee rights and responsibilities
  - 4) Hazard communication
  - 5) Fall Protection
  - 6) Good housekeeping practices
  - 7) Job Hazard Analysis (JHA)
  - 8) Pre Task Planning

- 9) Return to work programs, incident (to include near misses) reporting procedures, workers compensation requirements, and designated provider information.
- 10) Drug free workplace, substance abuse testing, completion of emergency contact and medical data using MSA's Medical Information Carrier System. The emergency contact and medical data shall be placed inside the hardhat and the reflective notification sticker on the exterior left rear side of the hardhat.
  - i. <http://www.meds.org/msa.php>

### **6.1.1 DOCUMENTATION**

- A. All employees will complete the Project Safety Orientation Training Acknowledgement Form in Appendix L at the end of the orientation training session. A copy of the completed form must be forwarded to the Program Manager prior to issuing of project ID card.

## SECTION 7. RECORDKEEPING REQUIREMENTS

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- A. The DIA OCIP believes that proper documentation and record keeping of safety related functions are essential. All required documentation needs to be maintained on site, available to the OCIP Safety Team upon request. The contractor's or subcontractor's Project Manager is responsible for ensuring that record keeping and related requirements, as outlined in this section, are accurate and up-to-date.
- B. There are several forms provided by the DIA OCIP that are to be used. If a contractor and/or subcontractor prefer to use their own forms, they should be submitted to the OCIP Safety Team for review and approval. As long as they meet or exceed the forms developed by the DIA OCIP they may be acceptable.

### 7.0 POSTERS

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- A. Post in a conspicuous place the Project Safety Alerts, Bulletins or Lessons Learned issued by the DIA OCIP and contractor as well as the posters required by federal and state regulation. Required workers' compensation insurance posters are available from the DIA OCIP Safety Team.

### 7.1 SIGNS

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- A. Contractors and subcontractors, of any tier, will need to furnish appropriate signage in accordance with the contract, depending on the nature of their work and work area, such as (but not limited to):
  - 1) *Hard Hats, safety glasses, and high visibility vest is Required Beyond This Point* (posted at all entrances to the project site and work areas).
  - 2) *Danger - Construction Area - Authorized Personnel Only* (posted at all entrances to the project site).
  - 3) *Drugs, Alcohol, Firearms and Related Paraphernalia are Prohibited on the Project* (posted at all entrances to the project site).

### 7.2 NEAR MISS REPORT

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- A. A 'near miss' is an unplanned event that did not result in injury, illness, or damage, —but had the potential to do so. Only a fortunate break in the chain of events prevented an injury, fatality or damage. Although human error is commonly an initiating event, a faulty process or system invariably permits or compounds the harm, and should be the focus of improvement. Complete the Near Miss Report Form in Appendix M for each near-miss event. Blank Near Miss Report forms are to be made readily available onsite to employees to report near misses. It is the responsibility of the contractor to encourage near miss reporting, investigate and report findings to OCIP Safety Team within forty-eight hours of the near miss occurrence.

### 7.3 *ACCIDENT/INCIDENT INVESTIGATION REPORTS*

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- A. Complete an accident investigation report for each accident resulting in injury or damage to materials or equipment. This includes the contractor's accident report form and applicable OCIP accident investigation forms in Appendix O. The contractor will provide a copy of investigative reports to the OCIP Safety Team within 7 working days of the accident.

### 7.4 *WEEKLY TOOL BOX SAFETY MEETING REPORT*

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- A. Conduct weekly safety toolbox meetings & complete the Weekly Tool Box Safety Meeting Report at the end of each week's meeting and maintain a copy onsite for review by OCIP Safety Team. See Sample Weekly Tool Box Safety Meeting Report in Appendix N.

### 7.5 *SAFETY OBSERVATIONS*

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- A. The OCIP Safety Team will complete written Safety Observations of work activities that are not in compliance with the project's safety policies and procedures. If a contractor or subcontractor receives a Safety Observation, immediately correct the hazard noted on the notice, document the corrective action, or reason for delayed abatement and return the report to the OCIP Safety Team within 24 hours.

### 7.6 *CONTRACTOR'S MONTHLY SAFETY REPORT*

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- A. The OCIP Safety Team will track leading and lagging safety statistics by contractor. In order to do this, each contractor will report the correct number of work hours worked on the project for the reporting month. This report will include:
  - 1) The work hours for the contractor's and subcontractor's employees;
  - 2) Incident types;
  - 3) OSHA recordability rates;
  - 4) Employment information;
  - 5) Project safety activities; and
  - 6) Details of injuries and illnesses.
- B. Send this report to the OCIP Safety Team by the 1<sup>st</sup> Tuesday of the following month. See Appendix R for Contractor's Monthly Safety Report.

## SECTION 8. ADMINISTRATIVE POLICIES

### 8.0 CONTRACTOR SAFETY PROGRAM REVIEW

- A. After the contractor submits the written SSSP, a meeting must be held to review the program with the Program Manager and OCIP Safety Team. The contractor must be prepared to discuss in detail the procedures to control the hazards likely to happen during major phases of the work, and the organizational assignments involved in administering the program. The contractor's principal onsite representative, general superintendent and safety representative must attend this meeting.

### 8.1 WEEKLY JOINT SAFETY MEETING

- A. The contractor's principal onsite representative and designated members of the respective staff must participate in scheduled weekly safety meetings with the Program Manager. The meetings must review the effectiveness of the contractor's safety effort, resolve health and safety issues relating to current or future operations, and provide a forum for developing the risk mitigation two week look ahead schedule.

### 8.2 SUPERVISORY SAFETY MEETINGS

- A. The contractor must conduct regularly scheduled (at least monthly) supervisory safety meetings for all levels of job supervision. The contractor will maintain a summary report containing subject matter and signatures of all attendees and make it available for review by the OCIP Safety Team.

### 8.3 INCIDENT NOTIFICATION

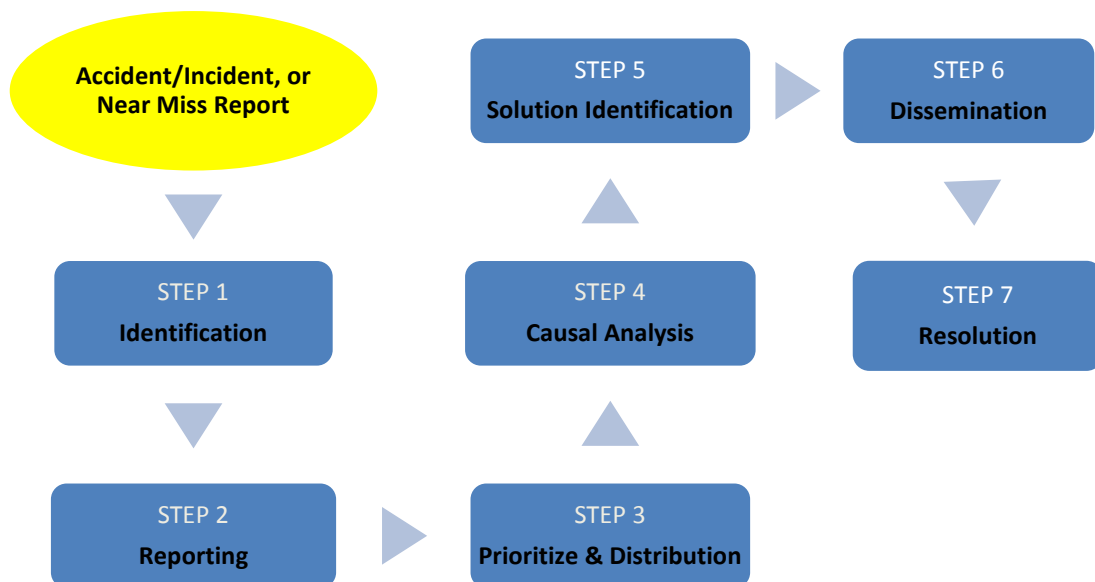
- A. The contractor shall report all incidents immediately to the Program Management Team. If the primary contact is not available, incidents shall be reported to one of the secondary contacts. Incident notification is not made until personal contact is made to either the Primary or Secondary Contacts listed below. Voicemail is not deemed as incident notification.

|                    | Name           | Cellular Phone Number |
|--------------------|----------------|-----------------------|
| Primary Contact    | Mark Potadle   | (720) 548-0352        |
| Secondary Contacts | Phil Ellsworth | (602) 361-6674        |
|                    | Jason Jeffries | (202) 631-2703        |

## 8.4 INCIDENT AND NEAR MISS INVESTIGATIONS

- A. All incidents, whether they involve injury or not (“near-miss”) must be reported to the Program Manager immediately and investigated by the contractor or subcontractor’s safety representative or designee and documented on the appropriate Project Incident report. The preliminary report must be completed and submitted to the OCIP Safety Team within twenty-four hours of the incident. The final investigative report and supporting documentation is due 7 days after the date of the incident.
- B. When accidents, incidents, or near-miss incidents are reported, then information is available about hazards and problems and action can be taken to make the work environments safer. Accident, incident, and near-miss incident reporting benefits are as follows:
  - 1) Areas of concern are identified.
  - 2) Awareness is increased.
  - 3) Hazards are resolved.
  - 4) Work environment is made safe.
- C. Most accidents, incidents, and near-miss incidents relate to system failure rather than individual mistakes. The contractor must have an open and fair reporting system so that employees can report problems without fear of reprisal. Contractor representatives gather the reporting information and disseminate this information to all project personnel so that everyone can learn from our projects and program accidents, incidents, and near-miss incidents. Investigative findings will be posted on the project safety bulletin boards for review by all employees.

Figure 1 illustrates the accident/incident and near miss incident reporting system flowchart



| Step No.                        | Description                                                                                                                                                                                                                              |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Identification                  | An accident/incident or near miss occurred                                                                                                                                                                                               |
| Reporting                       | An individual or group reports incident to Contractor / Subcontractor. Incident is reported to Program Manager and OCIP Safety Team                                                                                                      |
| Prioritization and Distribution | Incident is appraised and information pertaining to it is transferred to those who will assess follow-up action(s). OCIP Safety Team may be involved.                                                                                    |
| Causal Analysis                 | Based on the facts of incident, the cause(s) and underlying factors are identified by the contractor and reviewed by OCIP Safety Team                                                                                                    |
| Solution Identification         | Solutions to mitigate likelihood, limit impact of potential incident likelihood, or limit impact of the potential incident are identified, and corrective actions are determined by the contractor and reviewed by the OCIP Safety Team. |
| Dissemination                   | Follow-up corrective actions are relayed to relevant parties. Information is announced and disseminated to project personnel and OCIP Safety Team to increase awareness                                                                  |
| Resolution                      | Corrective actions are implemented and evaluated, and other follow-up action is completed by contractor/subcontractor and reviewed by the OCIP Safety Team.                                                                              |

## 8.5 CONSTRUCTION SITE EMERGENCY NOTIFICATION

- A. In the event of an emergency, the contractor should call **303-342-4211**.

## 8.6 LESSONS LEARNED

- A. The definition of a Lesson Learned is a “good work practice” or innovative approach that is captured and shared to promote repeat application. A Lesson Learned may also grow from an adverse work practice or experience that is captured and shared to avoid recurrence. The purpose of a Lessons Learned program is to communicate knowledge gained from past experiences that can help reduce risks, improve safety and efficiency, and enhance the cost effectiveness of similar operations. The goal of this program is to share and use experience based information to promote the recurrence of desirable activities, and prevent the recurrence of undesirable activities. All contractors and subcontractors are expected to plan and execute their work based on best available practices. Through their work experiences, all personnel are expected to identify opportunities for improvement and best practices and share these with their colleagues using the form in Appendix Q. Actions taken as a result of a Lesson Learned may include:
- 1) Corrective actions (taken as a result of the analysis of an actual experience)
  - 2) Preventive actions (taken to prevent a negative situation from occurring)
  - 3) Improvement actions (taken to improve the efficiency of operations based on a good work practice or an innovative approach)
- B. Use of Lessons Learned is a principal component of an organizational safety culture committed to continuous improvement. The methods used to instill Lessons Learned as



part of the culture vary, as do the mechanisms to identify, share and use Lessons Learned.

- C. The infrastructure mechanisms are often referred to as Lessons Learned Programs. Lessons Learned Programs include two basic processes:
  - 1) A development process that includes identification, documentation, validation, and dissemination of a Lesson Learned. The content of the Lesson Learned should contain the following five basic elements:
    - i. A clear statement of the lesson
    - ii. A background summary of how the lesson was learned
    - iii. Benefits of using the lesson and suggestions on how it may be used in the future
    - iv. Contact information for additional detail
    - v. Key data fields to aid searching for additional information
  - 2) A utilization and incorporation process that includes identification of applicable Lessons Learned, distribution to OCIP Safety Team, identification of actions as a result of the Lesson Learned, and follow-up to ensure that appropriate actions were taken.
- D. In addition, Lessons Learned Programs contain processes to measure operational performance improvement and program effectiveness.
- E. Properly implemented Lessons Learned will improve management decision making in every phase of a project. As a component of planning and execution, the contractor will establish expectations, provide resources, and monitor performance.

## **8.7 ACCIDENT/INCIDENT REVIEW WITH PROGRAM MANGER & OCIP SAFETY TEAM**

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- A. When notified by the Program Manger or OCIP Safety Team, all significant first aid incidents, recordable injuries/illnesses, builders' risk, and general liability incidents will require contractor/subcontractor management personnel to meet and review the findings of incident investigation and resolutions with Program Manager Representatives and the OCIP Safety Team. The contractors/subcontractors Project Manager, Safety Representative, involved supervisor/foremen and employee(s) must be in attendance and present investigative findings, causes/underlying factors and corrective actions.

## **8.8 EMPLOYEE DISCIPLINE & ENFORCEMENT**

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- A. The OCIP has established various rules and regulations, which serve as guidelines to acceptable employee behavior. In addition, specific job site rules may be established to meet the needs of the project. In either case, the rules and regulations of the OCIP, and jobsite rules, are subject to change, without prior notice, at the sole discretion of the OCIP's Administrators'.

- B. All employees need to be aware of the OCIP and contractor's work rules and regulations. Rules have been developed to assist the efficient operation of the Project and for the benefit and safety of all employees and general public. In general, any employee found to be in violation of OCIP Project rules will be subject to disciplinary action, including immediate suspension or permanent discharge.
- C. The following reflects the OCIP's Project policy for dealing with discipline and termination. This is not a list of every rule and regulation, but rather a description of the general project policy for dealing with employees who engage in unacceptable conduct.
- D. Corrective discipline is normally the responsibility of the job foreman or superintendent. One purpose of discipline is to motivate an employee to change his/her behavior. Discipline can be effective in helping an employee develop a more acceptable level of job performance. In every case, the Program Manager reserves the right, in its sole discretion, to determine the appropriate level of discipline.
- E. In the event that discipline is considered, the foreman or superintendent will identify the severity of the problem and determine the appropriate level of discipline. The Program Manager and contractor's recognize that the seriousness of offenses may vary. When violations of a less serious nature occur, a discussion between the employee and the supervisor will often be sufficient.
- F. In the case of more serious violation, a written warning will be issued. On some occasions, because of the seriousness of the offense, a written warning may be given even though a verbal warning has not been issued. Certain other offenses will be of such a serious nature that they will be grounds for immediate suspension and /or discharge.
- G. Verbal or written warnings are often appropriate for minor infractions and first time offenses. A warning should include an explanation of the problem, which has been identified, with an opportunity for the employee to respond.
- H. Discharge of an employee will be considered if the desired change in an employee's conduct is not accomplished through prior actions.
- I. Employee misconduct may be of such a high level of seriousness that immediate termination will result. Examples of more serious misconduct include, but are not limited to violation of the Substance Abuse Policy, blatant disregard for personal and public safety, disregard of the OCIP Safety Plan, fighting, theft and falsification of records.
- J. In any given case, the Program Manager or the Contractor may find it appropriate to impose greater or lesser disciplinary action, based on individual circumstances.
- K. Nothing in this policy should be construed as limiting the discretion to impose any level of discipline at any time, up to and including discharge, as circumstances warrant.
- L. Nothing in this policy alters an employee's status as an "at will" employee or creates any contractual rights, either expressed or implied. The Program Manager will apply this Policy in a matter that is consistent with the requirements appropriate to local, state and federal laws.
- M. This policy will remain in effect until it is changed or updated by the Program Manager.

## 8.9 *DESIGNATED PROVIDER LIST*

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- A. When the contractor has been notified of an on the job injury, the contractor shall provide the injured worker with a written designated provider list provided by the insurer (The Hartford/Sedgwick CMS), from which the injured worker may select a physician. See Appendix S for Designated Provider List.
- B. The injured employee or employer must complete the Authorization Form in Appendix T upon arrival at the OccMed Colorado clinic.
- C. In an emergency situation the injured worker shall be taken to any physician or medical facility that is able to provide the necessary care. When emergency care is no longer required the provisions of paragraph (A) apply.
- D. If the injured worker is away from the worker's usual place of employment at the time of the injury, the injured worker may be referred to a physician in the vicinity where the injury occurred who can attend to the injury. Within seven (7) business days following the date the contractor has notice of the injury the contractor shall comply with the provisions of paragraph (A).

## 8.10 *TRANSITIONAL DUTY*

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- A. The contractor and its subcontractors of any tier shall provide a Transitional Duty program (also known a "Return-to-Work" "Light Duty" or "Modified Work") to any injured employee who is released by a medical doctor to return-to-work with restrictions, or for modified or alternative work. Restricted Duty shall be an assignment provided to an employee who, because of a job-related injury or illness, is physically or mentally unable to perform all or any part of his/her normal assignment during all or any part of the normal workday or shift for a minimum duration of 90 days.
  - 1) All work related injuries must be reported to the affected worker's supervisor, the contractor and the Program Safety Manager immediately.
  - 2) If any employee has any doubt as to where to go for medical treatment for a job-related injury, they must contact the contractor. All employees must report to one of the designated providers listed in Appendix S
  - 3) Project policy is to return Contractor employees to work as soon as possible after a job-related injury or illness has occurred. All possible opportunities will be considered to provide Transitional Duty Assignments.
  - 4) When an injured employee returns to work, all physical and mental limitations must be evaluated so that additional injury or aggravation does not occur. The safety of other employees working with the injured individual must also be considered.
  - 5) The program safety manager, claims coordinator, and the insurance carrier will evaluate all injuries and illnesses on case-by-case basis.
  - 6) Injured employees may return to work on Transitional Duty under the following circumstances:
    - i. The employee's attending physician has determined the physical restrictions.

- ii. The contractor has a task that can be assigned that meets the restrictions.
  - iii. The Contractor's Project Managers, Supervisors, and Foreman are informed of the injured employee's restrictions.
- 7) The employee must receive full medical release from a physician before resuming normal work activities, which would violate medical restrictions.
- 8) No employee on Transitional Duty will be allowed to work more than (40) forty-hours per week.
- 9) The injured employee will remain on the project where the injury occurred while on transitional duty.
- 10) When injured employees are off duty they shall follow work restrictions.
- 11) The contractor and/or subcontractors shall discuss employee injury management protocol with Arthur J. Gallagher Representative Kendall Trump (303) 889-2570 prior to any injured employee being laid-off or terminated from a Transitional Duty program.

### 8.11 SAFETY AWARENESS

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- A. Communication and awareness are essential to developing a proactive project safety culture. The goal of the safety awareness program is to raise awareness of day-to-day risks, hazards, and exposures in the field. The contractor is responsible for developing and submitting innovative ideas for campaign suggestions for implementation. Safety awareness program initiatives may include:
  - 1) Project specific safety stickers
  - 2) Volunteer safety stewards
  - 3) Safety posters
  - 4) Days at Zero signs at entrances, lunchrooms, etc.
  - 5) Guest speakers for employee meetings
  - 6) Banners addressing specific hazards on the project
  - 7) Whiteboards for employees to identify *Today's Biggest Risk in This Area*

### 8.12 THIRD PARTY INSPECTIONS

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- A. In addition to visits and inspections by the contractor's representatives, the contractor is advised that the project may be inspected from time to time by authorized third parties. Among others so authorized are representatives of the owner, its agents and insurance companies.
  - 1) Timely notification of third party inspections will be provided by the Program Manager. The contractor's site safety representative is required to attend and participate in these inspections.
    - i. Contractor representatives will have an opportunity to review and discuss inspection results prior to the departure of third party representatives from the project site.

### 8.13 OSHA INSPECTIONS

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- A. Inspections by OSHA compliance officers may be initiated for many reasons, including employee complaints, serious or fatal accidents, special emphasis programs or planned audits. When a contractor or subcontractor receives notification of an impending inspection, contact the OCIP Safety Team so a representative of the OCIP Safety Team can be present during the actual inspection. It is the OCIP Safety Teams policy to fully cooperate with OSHA compliance officers.

## **APPENDIX A     MODEL SITE SPECIFIC SAFETY PLAN (SSSP)**

**INSTRUCTIONS FOR THIS MODEL PROGRAM** Every Contractor & Subcontractor, and their subcontractors, must establish, implement and maintain a written site specific safety plan (SSSP) and a copy must be maintained at each work site. The Contractor & Subcontractor must comply with the contract and must complete the model program to detail specific issues relating to the following elements:

- Accountability/Responsibility/Key Line Personnel to include Site Safety Representative
- Statement of Contractor's Safety and Health Policy
- Identification of Competent/Qualified Persons
- Scope of Work Evaluation
- Hazard/Risk/Exposure Assessment
- Control Measures/Job Hazard Analysis/Pre-Task Planning Activities
- Subcontractor Periodic Safety Audits/Inspections
- Subcontractor's Weekly Safety Planning – Weekly Look Ahead Plan
- Compliance Requirements and Policy
- Written Progressive Disciplinary Program
- Hazard Correction System
- Training and Instruction
- Project Site Orientation
- Communication System
- Recordkeeping
- Accident/Exposure Investigation
- Crisis Management Plan
- Site-Specific Medical Emergency Plan
- Written Hazard Communication Program
- Written Trenching and Shoring Plan (if applicable)
- Written 100% Fall Protection Plan (if applicable)
- Other written programs as specified by regulatory agency or OCIP Safety Manual

This model program has been prepared only as an aid for use by Contractors and Subcontractors. Contractors and Subcontractors are solely responsible for the content of their own SSSPs. This model program was written for a broad spectrum of employers and it should be modified as appropriate to provide the essential framework required for a site specific safety plan on this Project. Proper use of this model program requires the Project Manager/Superintendent of your firm to carefully review the requirements for each of the SSSP elements found in this model. Should your firm choose to utilize this model complete the appropriate blank spaces and check those items that are applicable to your workplace. Sample forms for hazard assessment and correction, accident/exposure investigation, and worker training and instruction are provided with this model program. This model program

must be maintained by the Contractor's/Subcontractor's Project Manager in order to be effective.

**1. Responsibility/Identification of Key Line Personnel**

Contractor:

Address:

Telephone

Fax

Email

Company Executive responsible for project: Contact No.

Manager/Superintendent: Contact No.

Safety Representative/Manager: Contact No.

Field Supervisors or forepersons: Contact No.

Program Manager POC: Contact No.

Provide 24/7 phone numbers for key personnel.

All managers and supervisors are responsible for implementing and maintaining the SSSP in their work areas and for answering worker questions about the SSSP. A copy of this SSSP is available from each manager and supervisor.

2. **Statement of Subcontractor's Safety and Health Policy** Include your company statement here
3. **Identification of Competent/Qualified Persons** List/Submit Certificate
4. **Scope of Work Evaluation** List Major Activities
5. **Hazard/Risk/Exposure Assessment** List Hazards and Exposures here Major hazards or risks and exposures associated with the scope of work evaluation must be listed here. Each major activity must be evaluated and a Job Hazards Analysis developed.
6. **Control Measures/Activity Hazard Analysis** (Provide an Appendix to include Hazard Control Measures and Job Hazard Analysis for Risks Listed in #5)
7. **Subcontractor Daily Safety Inspections** Daily inspections to identify and evaluate on-going workplace hazards must be performed by the following competent persons or observers in the following areas of our workplace:

Competent Person/Observer

Area of Expertise/Responsibility

Periodic inspections are performed according to the following schedule:

- Daily
- When we initially establish our SSSP;
- When new substances, processes, procedures or equipment which present potential new hazards are introduced into our workplace;
- When new, previously unidentified hazards are recognized;
- When occupational injuries and illnesses occur;
- When we hire and/or reassign permanent or intermittent workers to processes, operations, or tasks for which a hazard evaluation has not been previously conducted; and
- Whenever workplace conditions warrant an additional inspection.

8. **Contractor Risk Mitigation Tw-Week Look-Ahead Planning Submission** The form in the appendices can be used to plan risk mitigation strategies at weekly progress meetings.

9. **Compliance Requirements Policy** Management is responsible for ensuring that all safety and health policies and procedures are clearly communicated and understood by all employees. Managers and supervisors are expected to enforce the rules fairly and uniformly. All employees are responsible for using safe work practices, for following all directives, policies and procedures, and for assisting in maintaining a safe work environment. Our system of ensuring that all workers comply with the rules and maintain a safe work environment includes:

- Informing workers of the provisions of our SSSP and the OCIP Safety Manual.
- Evaluating the safety performance of all workers.
- Recognizing employees who perform safe and healthful work practices.
- Providing training to workers whose safety performance is deficient.
- Disciplining workers for failure to comply with safe and healthful work practices; and
- The following practices:

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10. **Written Progressive Disciplinary Program** (Explain or attach written program)

11. **Hazard Correction Policy** Unsafe or unhealthy work conditions; practices or procedures must be corrected in a timely manner based on the severity of the hazards. Hazards must be corrected according to the following procedures:

- When observed or discovered;
- When an imminent hazard exists which cannot be immediately abated without endangering employees or property, we will remove all exposed workers from the



area except those necessary to correct the existing condition. Workers necessary to correct the hazardous condition must be provided with the necessary protection; and

- All such actions taken and dates they are completed must be documented on the appropriate forms.

**12. Training and Instruction Policy** All workers, including managers and supervisors, must have training and instruction on general and job-specific safety and health practices. Training and instruction must be provided as follows:

- When the SSSP is first established;
- To all new workers;
- To all workers given new job assignments for which training has not previously provided;
- Whenever new substances, processes, procedures or equipment are introduced to the workplace and represent a new hazard;
- Whenever the employer is made aware of a new or previously unrecognized hazard;
- To supervisors to familiarize them with the safety and health hazards to which workers under their immediate direction and control may be exposed; and
- To all workers with respect to hazards specific to each employee's job assignment.

Workplace safety and health practices for all locations include, but are not limited to, the following:

- Explanation of the employer's SSSP, HRT JV Project Safety Manual, emergency action plan and fire prevention plan, and measures for reporting any unsafe conditions, work practices, injuries and when additional instruction is needed.
- Use of appropriate clothing, including gloves, footwear, and personal protective equipment.
- Information about chemical hazards to which employees could be exposed and other hazard communication program information.
- Availability of toilet, hand-washing, and drinking water facilities.
- Provisions for medical services and first aid including emergency procedures.

In addition, we provide specific instructions to all workers regarding hazards unique to their job assignment, to the extent that such information was not already covered in other training.

**13. Employee Orientation Program** We orient our workers about the following checked subjects:

- OCIP safety requirements
- The employer's code of safe practices.
- Road and highway safety practices

- Confined spaces.
- Safe practices for operating any equipment.
- Good housekeeping, fire prevention
- Safe procedures for cleaning, repairing, servicing and adjusting equipment and machinery.
- Safe access to working areas.
- Electrical hazards, including working around high voltage lines.
- Crane operations.
- Trenching and excavation work.
- Proper use of powered tools.
- Guarding of belts and pulleys, gears and sprockets, and conveyor nip points.
- Machine, machine parts, and prime movers guarding.
- Lockout/tagout procedures.
- Materials handling.
- Chainsaw and other power tool operation.
- Unsafe weather conditions.
- Rigging and communication.
- Landing and loading areas, including release of rigging, landing layout, moving vehicles and equipment, truck locating, loading and shipping.
- Fall protection from elevated locations.
- Use of elevated platforms
- Driver safety.
- Slips, falls, and back injuries.
- Ergonomic hazards, including proper lifting techniques and working on ladders or in a stooped posture for prolonged periods at one time.
- Personal protective equipment.
- Respiratory Equipment.
- Hazardous chemical exposures.
- Hazard communication.
- Physical hazards, such as heat stress, noise, and ionizing and non-ionizing radiation.
- Laboratory safety.
- Bloodborne pathogens and other biological hazards.
- Other job-specific hazards, such as \_\_\_\_\_

14. **Employee Communication System and Policy** We recognize that open, two-way communication between management and staff on health and safety issues is essential to an injury-free, productive workplace. The following system of communication is designed to facilitate a continuous flow of safety and health information between management and staff in a form that is readily understandable and consists of one or more of the following checked items:

- New worker orientation including a discussion of safety and health policies and procedures.
  - Review of our SSSP and OCIP Safety Manual.
  - Workplace safety and health training programs.
  - Regular weekly and daily safety meetings.
  - Effective communication of safety and health concerns between workers and supervisors, including translation where appropriate.
  - Posted or distributed safety information.
  - A system for workers to anonymously inform management about workplace hazards.
  - Other:
- 
- 

15. **Recordkeeping Policy** We have taken the following steps to document the implementation of our SSSP:

- Records of hazard assessment inspections, including the persons conducting the inspection, the unsafe conditions and work practices that have been identified and, the action taken to correct the identified unsafe conditions and work practices are recorded on a hazard assessment and correction form
- Documentation of safety and health training for each worker, including the worker's name or other identifier, training dates, types of training, and training providers are recorded on a worker training and instruction form.
- Other records are retained as required by contract specifications or by local, state or federal (OSHA regulations). Where regulations do not specify the length of records retention, a period of three years after project completion will be used.

16. **Accident Investigations Policy** Procedures for investigating workplace accidents include:

- Responding to the accident scene as soon as possible;
- Reporting immediately to the appropriate Program Manager point-of-contact and OCIP
- Interviewing injured workers and witnesses;
- Examining the workplace for factors associated with the accident;
- Determining the cause of the accident;
- Taking corrective action to prevent the accident from reoccurring;
- Recording the findings and corrective actions taken; and
- Post-accident substance abuse testing.

17. **Emergency Action Plan** (Define assembly areas, head count procedure etc.)

18. **Site Specific Medical Emergency Plan** (Define/ provide emergency contact numbers, competent first-aider, provider locations, etc.)

19. **Hazard Communication Program** (Attach written program and MSDSs)
20. **Written Trenching and Shoring Plan** (Attach if applicable)
21. **Written 100% Fall Protection Plan** (Attach if applicable)
22. **Attach other written programs as required by regulation and applicable to this project.**
23. **List of Attachments**
  - Daily Safety Inspection Record
  - Accident Inspection Report Form
  - Sample Training Record
  - Subcontractors Weekly Safety Planning Submission

## APPENDIX B JOB HAZARD ANALYSIS

### Job Hazard Analysis (JHA)

|                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |              |            |                |            |                                                                                                   |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------|----------------|------------|---------------------------------------------------------------------------------------------------|
| JHA #:                                       | Overall Risk Assessment Code (RAC) (Use highest code)                                                                                                                                                                                                                                                                                                                                                                                                                                                 |              |            |                |            |                                                                                                   |
| Activity/Work Task:                          | Risk Assessment Code (RAC) Matrix                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |              |            |                |            |                                                                                                   |
|                                              | Severity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Probability  |            |                |            |                                                                                                   |
| Date Prepared :                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Frequent (F) | Likely (L) | Occasional (O) | Seldom (S) | Unlikely (U)                                                                                      |
| Prepared by:                                 | Catastrophic (C)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | E            | E          | H              | H          | M                                                                                                 |
|                                              | Critical (Cr)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | E            | H          | H              | M          | L                                                                                                 |
| Reviewed by:                                 | Marginal (M)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | H            | M          | M              | L          | L                                                                                                 |
|                                              | Negligible (N)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | M            | L          | L              | L          | L                                                                                                 |
| Notes: (Field Notes, Review Comments, etc.): | Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above).<br>The RAC is developed after correctly identifying all the hazards and fully implementing all controls.                                                                                                                                                                                                                                                                                                |              |            |                |            |                                                                                                   |
| References :                                 | P "Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent (F), Likely (L), Occasional (O), Seldom (S) or Unlikely (U).<br>S "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic (C), Critical (Cr), Marginal (M), or Negligible (N).<br>Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA. |              |            |                |            | <b>RAC Chart</b><br>E = Extremely High Risk<br>H = High Risk<br>M = Moderate Risk<br>L = Low Risk |

| Job Steps            | Hazards                                                | Controls                | P | S | RAC |
|----------------------|--------------------------------------------------------|-------------------------|---|---|-----|
|                      |                                                        |                         |   |   |     |
|                      |                                                        |                         |   |   |     |
|                      |                                                        |                         |   |   |     |
|                      |                                                        |                         |   |   |     |
|                      |                                                        |                         |   |   |     |
| Equipment to be Used | Training Requirements/Competent or Qualified Personnel | Inspection Requirements |   |   |     |
|                      |                                                        |                         |   |   |     |
|                      |                                                        |                         |   |   |     |
|                      |                                                        |                         |   |   |     |
|                      |                                                        |                         |   |   |     |

## Job Hazard Analysis (JHA) Example

|                                                                     |                                                                                                                                                                                                        |              |            |                |                         |              |
|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|------------|----------------|-------------------------|--------------|
| JHA #: 001                                                          | Overall Risk Assessment Code (RAC) (Use highest code)                                                                                                                                                  |              |            |                |                         | H            |
| Activity/Work Task: Setting Forms for Sidewalk and pouring concrete | Risk Assessment Code (RAC) Matrix                                                                                                                                                                      |              |            |                |                         |              |
| Date Prepared : 01/01/2011                                          | Severity                                                                                                                                                                                               | Probability  |            |                |                         |              |
|                                                                     |                                                                                                                                                                                                        | Frequent (F) | Likely (L) | Occasional (O) | Seldom (S)              | Unlikely (U) |
| Prepared by: W. Jones                                               | Catastrophic (C)                                                                                                                                                                                       | E            | E          | H              | H                       | M            |
|                                                                     | Critical (Cr)                                                                                                                                                                                          | E            | H          | H              | M                       | L            |
| Reviewed by: B. Smith                                               | Marginal (M)                                                                                                                                                                                           | H            | M          | M              | L                       | L            |
|                                                                     | Negligible (N)                                                                                                                                                                                         | M            | L          | L              | L                       | L            |
| Notes: (Field Notes, Review Comments, etc.):                        | Step 1: Review each "Hazard" with identified safety "Controls" and determine RAC (See above).<br>The RAC is developed after correctly identifying all the hazards and fully implementing all controls. |              |            |                |                         |              |
| References : SSSP, Excavation Checklist,                            | P "Probability" is the likelihood to cause an incident, near miss, or accident and identified as: Frequent (F), Likely (L), Occasional (O), Seldom (S) or Unlikely (U).                                |              |            |                | RAC Chart               |              |
|                                                                     | S "Severity" is the outcome/degree if an incident, near miss, or accident did occur and identified as: Catastrophic (C), Critical (Cr), Marginal (M), or Negligible (N)                                |              |            |                | E = Extremely High Risk |              |
|                                                                     | Step 2: Identify the RAC (Probability/Severity) as E, H, M, or L for each "Hazard" on AHA. Annotate the overall highest RAC at the top of AHA.                                                         |              |            |                | H = High Risk           |              |
|                                                                     |                                                                                                                                                                                                        |              |            |                | M = Moderate Risk       |              |
|                                                                     |                                                                                                                                                                                                        |              |            |                |                         | L = Low Risk |

| Job Steps                                        | Hazards                                                                                         | Controls                                                                                                                                                                                                                                                                                       | P | S  | RAC |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----|-----|
| Grade and level area with earth moving equipment | Struck by moving equipment (confined/restrictive area with a lot of mobile equipment operating) | <ul style="list-style-type: none"> <li>Hi-Viz vests required</li> <li>Operable back up alarm</li> <li>Do not approach equipment in operation unless operator gives positive indication that it is okay.</li> <li>Use spotter if necessary</li> <li>Barricade work area if necessary</li> </ul> | S | CR | H   |
| Laser equipment used for reference leveling      | Eye damage                                                                                      | <ul style="list-style-type: none"> <li>Turn off laser equipment when not in use</li> <li>Instruct EE's on hazards of looking at the laser emitting device</li> </ul>                                                                                                                           | U | N  | L   |
|                                                  | Interference with FAA NAVAID systems                                                            | <ul style="list-style-type: none"> <li>Coordinate with Airport Operations/FAA</li> </ul>                                                                                                                                                                                                       | U | C  | M   |
| Performing tasks in excavation                   | Trench Collapse - South end of sidewalk footprint is 6' below existing grade in type C soil     | <ul style="list-style-type: none"> <li>Slope excavation to a 1 ½ to 1 ratio</li> <li>Install ladder for egress</li> <li>Inspect excavation regularly by competent person</li> </ul>                                                                                                            | U | M  | L   |

| Job Steps                                    | Hazards                                                | Controls                                                                                                                                                         | P      | S      | RAC    |
|----------------------------------------------|--------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|--------|--------|
| Cutting wood forms with circular saw         | Lacerations                                            | • Use saw horses to hold material while cutting                                                                                                                  | O      | M      | M      |
|                                              | Noise                                                  | • Inspect saw- blade sharp, guards in place                                                                                                                      | U      | N      | L      |
|                                              | Splinters                                              | • Wear N-29 hearing protection<br>• Wear leather work gloves                                                                                                     | O      | N      | L      |
| Setting and securing forms with rebar stakes | Struck by hammer<br>Impalement on rebar stakes         | • Clear others of area<br>• Install impalement protection when stakes are installed                                                                              | U<br>U | M<br>M | L<br>L |
| Pouring/finishing concrete                   | Struck by moving concrete trucks or pumper             | • Hi-Viz vests required<br>• Operable back up alarm<br>• Do not approach equipment in operation unless operator gives positive indication that it is okay.       | S      | CR     | H      |
|                                              | Struck by concrete pumper hose                         | • Use spotter if necessary<br>• Only trained EE's will handle the whip hose.<br>• Concrete pump operator and EE handling whip hose will coordinate hand signals. | S      | N      | L      |
|                                              | Concrete burns                                         | • Proper PPE-safety glasses, rubber gloves/boots, long sleeve shirt<br>• Water be available to wash concrete from skin                                           | S      | N      | L      |
| Equipment to be Used                         | Training Requirements/Competent or Qualified Personnel | Inspection Requirements                                                                                                                                          |        |        |        |
| Dozer                                        | J. Crew-Qualified Operator                             | Daily equipment inspection                                                                                                                                       |        |        |        |
|                                              | D. Martin – Competent Person for Excavations           | Frequently Inspect excavation                                                                                                                                    |        |        |        |
|                                              |                                                        |                                                                                                                                                                  |        |        |        |
|                                              |                                                        |                                                                                                                                                                  |        |        |        |

## APPENDIX C DAILY PRE-TASK PLANNING SHEET

### Daily Pre-Task Planning

Supervisor/Foreman: \_\_\_\_\_ Date: \_\_\_\_\_

Job Activity: \_\_\_\_\_

Signature – Supervisor/Foreman

Signature – Project Manager/Safety Manager

#### LIST TASKS

- |          |           |
|----------|-----------|
| 1. _____ | 6. _____  |
| 2. _____ | 7. _____  |
| 3. _____ | 8. _____  |
| 4. _____ | 9. _____  |
| 5. _____ | 10. _____ |

#### REQUIRED TOOLS

|                          |                        |                       |
|--------------------------|------------------------|-----------------------|
| Air Compressor _____     | Electrical Drill _____ | Port Bandsaw _____    |
| Electrical Grinder _____ | Roto Hammer _____      | Chipping Gun _____    |
| Generator _____          | Sawzall _____          | Welding Machine _____ |
| Chop Saw _____           | Hydraulic Jacks _____  | Skill Saw _____       |
| Cutting Torch _____      | Impact Wrench _____    | Other Tool: _____     |
| Ladder _____             | Electric Cords _____   | Other Tool: _____     |
| Powder Actuated _____    | Welding Leathers _____ | Other Tool: _____     |

#### REQUIRED EQUIPMENT

|                    |                  |                             |
|--------------------|------------------|-----------------------------|
| Crane _____        | Dump Truck _____ | Aerial Lift: _____          |
| Motor Grader _____ | Scraper _____    | Suspended Personnel _____   |
| Compactor _____    | Roller _____     | Platforms/Manbaskets: _____ |
| Excavator _____    | Dozer _____      | Other: _____                |

#### IDENTIFY POTENTIAL HAZARDS

|                        |                        |                             |
|------------------------|------------------------|-----------------------------|
| Particles in Eye _____ | Chemical Burn _____    | Thermal Burn _____          |
| Overexertion _____     | Elevated Load _____    | Live Utilities (above _____ |
| Abrasion/Cuts _____    | Struck By _____        | /below grade) _____         |
| Falls Over 6' _____    | Overhead Work _____    | Dropping Material & _____   |
| Strains/Sprains _____  | Trip/Slip/Fall _____   | Tools to Lower Level _____  |
| Fire _____             | Cave-in _____          | Moving Machinery _____      |
| Loud Noises _____      | Heat/Cold Exp. _____   | Moving Aircraft _____       |
| Pinch Points _____     | Electrical Shock _____ | Other: _____                |
| Other: _____           | Other: _____           | Other: _____                |

#### IDENTIFY HAZARD ELIMINATION

|                         |                         |                                 |
|-------------------------|-------------------------|---------------------------------|
| Fall Protection _____   | Toeboards/Netting _____ | Be in the Proper Position _____ |
| Keep Area Cleaned _____ | Sloping/Shoring _____   | /Situational Awareness _____    |
| Guardrails _____        | Proper Rigging _____    | Tools/Materials Secured _____   |
| Fire Watch/Exting _____ | Taglines _____          | Coordination with Other _____   |
| Make Eye Contact _____  | Get Help _____          | Trades _____                    |

Additional Hazard Controls: \_\_\_\_\_

#### REQUIRED PERSONAL PROTECTIVE EQUIPMENT

|                       |                          |                        |
|-----------------------|--------------------------|------------------------|
| Hardhat _____         | Hearing Protection _____ | Safety Goggles _____   |
| Safety Glasses _____  | Face Shield _____        | Welding Leathers _____ |
| Reflective Vest _____ | Metatarsal Guards _____  | Welding Hood _____     |
| Safety Boots _____    | Rubber Boots _____       | Other PPE: _____       |
| Work Gloves _____     | Rubber Gloves _____      | Other PPE: _____       |

#### Permits and Plans Issued? (Check all that Apply)

|                                        |                                 |                             |
|----------------------------------------|---------------------------------|-----------------------------|
| Fall Protection Plan _____             | Crane: Critical Lift Plan _____ | Confined Space Permit _____ |
| Energized Electrical Work Permit _____ | Hot Work Permit _____           | Excavation Plan _____       |
| Other: _____                           | Other: _____                    | Other: _____                |

List each employee covered by this Pre-Task Planning Sheet: (Print name and have each employee initial to acknowledge understanding of job specific hazards/mitigations identified by this Pre-Task Planning Sheet)

| Name  | Initials | Name  | Initials |
|-------|----------|-------|----------|
| _____ | _____    | _____ | _____    |
| _____ | _____    | _____ | _____    |
| _____ | _____    | _____ | _____    |
| _____ | _____    | _____ | _____    |
| _____ | _____    | _____ | _____    |
| _____ | _____    | _____ | _____    |
| _____ | _____    | _____ | _____    |
| _____ | _____    | _____ | _____    |
| _____ | _____    | _____ | _____    |
| _____ | _____    | _____ | _____    |

#### Near Miss Report

Time of Occurrence: \_\_\_\_\_

Describe Near Miss: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Actions Taken to Correct/Prevent Similar Incidents: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



## APPENDIX D RISK MITIGATION TWO WEEK LOOK AHEAD

### South Terminal Redevelopment Program

#### RISK MITIGATION/TWO WEEK LOOK AHEAD

DATE:

CM/GC:

PM:

Sub Contractors (if necessary):

Phone:

Report Prepared by:

| CONSTRUCTION LOOK AHEAD |          |                     |                          |                  |                                         |                                      |            |          |
|-------------------------|----------|---------------------|--------------------------|------------------|-----------------------------------------|--------------------------------------|------------|----------|
| Scheduled Start         | Duration | Description of Work | Identified Risks/Hazards | Control Measures | Potential Impacts (Public/Stakeholders) | Coordination Required (Stakeholders) | Supt/Phone | Doc/MHT# |
| Week One                |          |                     |                          |                  |                                         |                                      |            |          |
|                         |          |                     |                          |                  |                                         |                                      |            |          |
|                         |          |                     |                          |                  |                                         |                                      |            |          |
|                         |          |                     |                          |                  |                                         |                                      |            |          |
| Week Two                |          |                     |                          |                  |                                         |                                      |            |          |
|                         |          |                     |                          |                  |                                         |                                      |            |          |
|                         |          |                     |                          |                  |                                         |                                      |            |          |
|                         |          |                     |                          |                  |                                         |                                      |            |          |

| ADDITIONAL LOOK AHEAD                   |  |
|-----------------------------------------|--|
| Additional Job Hazard Analysis Required |  |
| Subs Mobilized/ Demobilized             |  |
| Audits/ Inspections Scheduled           |  |
| Competent Persons Changes               |  |
| Planned Orientation/ Training           |  |
| Upcoming Procurements                   |  |

Email Report:

[phil.ellisworth@parsons.com](mailto:phil.ellisworth@parsons.com)[jason.jeffries@parsons.com](mailto:jason.jeffries@parsons.com)[kelli.kelly@parsons.com](mailto:kelli.kelly@parsons.com)[amyford@belaycommunications.com](mailto:amyford@belaycommunications.com)

ADDITIONAL COMMENTS (Major anticipated activities, issues, etc.):

## APPENDIX E SUBCONTRACTOR PREMOBILIZATION SAFETY MEETING

### Subcontractor Premobilization Safety Meeting

Date: \_\_\_\_\_ Project/Location: \_\_\_\_\_

Contractor Representatives: \_\_\_\_\_

Subcontractor Representatives: \_\_\_\_\_

The following project site safety, health and security requirements, procedures, and hazards have been identified and reviewed with the Subcontractor.

|  |                                                    |  |                                                                                      |  |
|--|----------------------------------------------------|--|--------------------------------------------------------------------------------------|--|
|  | SSSP/Emergency Planning/Crisis Com                 |  | Demolition                                                                           |  |
|  | Competent/Qualified Person                         |  | Personal Protective Equipment                                                        |  |
|  | Hazardous Materials/Waste                          |  | Cranes/Hoists/Annual Inspection Certificate                                          |  |
|  | Vehicle/Heavy Equipment                            |  | Overhead Power Lines                                                                 |  |
|  | Lockout/Tagout                                     |  | Confined Spaces (Permit/Non-Permit)                                                  |  |
|  | Electrical                                         |  | Excavations/Trenching                                                                |  |
|  | Fire Protection                                    |  | Site Security/Visitor Control/Public Exposure                                        |  |
|  | Hot Work/Welding/Cutting                           |  | Risk Mitigation Two Wk Look Ahead, Daily PreTask Planning Sheet, Job Hazard Analysis |  |
|  | Fall Protection/Guardrails/<br>Scaffolding/Ladders |  | Permits<br>(Excavation/Scaffolding/Demolition/Traffic/<br>Confined Space/etc.)       |  |

Additional Project Concerns:

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Other Attendees:

| Name | Title | Company |
|------|-------|---------|
|      |       |         |
|      |       |         |
|      |       |         |
|      |       |         |
|      |       |         |
|      |       |         |

## APPENDIX F CRITICAL LIFT PLAN (CRANES)

### Critical Lift Plan

Crane Make/Model/Serial #: \_\_\_\_\_ Anticipated Lift Date: \_\_\_\_\_

Lift Location: \_\_\_\_\_

Load Description: \_\_\_\_\_

- Required Attachments:
- |                                                                                |                                                                                 |
|--------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| <input type="checkbox"/> Copy of load chart for applicable crane configuration | <input type="checkbox"/> Diagram of crane lift & load placement                 |
| <input type="checkbox"/> Rigging certifications                                | <input type="checkbox"/> Diagram of rigging configuration with load calculation |
| <input type="checkbox"/> Copy of crane's annual inspection                     |                                                                                 |

#### A. Load

1. Wt. of load \_\_\_\_\_ lbs
2. Wt. of auxiliary block \_\_\_\_\_ lbs
3. Wt. of main block \_\_\_\_\_ lbs
4. Wt. of lifting beam \_\_\_\_\_ lbs
5. Wt. of slings/shackles/other rigging \_\_\_\_\_ lbs
6. Wt. of jib (erected/stowed/stored) \_\_\_\_\_ lbs
7. Wt. of hoist rope (#parts X L X unit wt.) \_\_\_\_\_ lbs
8. Wt. of excess load material \_\_\_\_\_ lbs
9. Other \_\_\_\_\_ lbs

#### GROSS WEIGHT

Source of load Wt. information (drawings, calcs, etc.) \_\_\_\_\_

Load Wt. confirmed by: \_\_\_\_\_

#### B. Crane

1. Type of crane \_\_\_\_\_
2. Counterweight \_\_\_\_\_ lbs
3. Boom length \_\_\_\_\_ ft / boom configuration \_\_\_\_\_
4. Radius at pick-up \_\_\_\_\_ ft/set-down \_\_\_\_\_ ft
5. Crane capacity at radius: over rear \_\_\_\_\_ lbs  
over side \_\_\_\_\_ lbs / over front \_\_\_\_\_ lbs
6. Boom angle at pickup \_\_\_\_\_ ft / set down \_\_\_\_\_ ft
7. Max. rated capacity of crane at this boom length, radius and boom angle for this lift \_\_\_\_\_ lbs
8. Max. load on crane for this lift is \_\_\_\_\_ lbs
9. Lift is \_\_\_\_\_ % of the crane's rated capacity

#### C. Jib/Fly

1. Erected \_\_\_\_\_ Stowed \_\_\_\_\_ Stored \_\_\_\_\_
2. If jib/fly to be used: length \_\_\_\_\_ angle \_\_\_\_\_
3. Rated capacity of jib/fly from chart \_\_\_\_\_ lbs

#### D. Hoist Rope

1. Rope diameter \_\_\_\_\_ Number of parts \_\_\_\_\_
2. Lift capacity based on parts \_\_\_\_\_ lbs

#### E. Rigging

1. Sling configuration (chocker, basket, straight)
2. Sling material \_\_\_\_\_
3. No. of slings \_\_\_\_\_ size \_\_\_\_\_ length \_\_\_\_\_
4. Sling assembly rated capacity \_\_\_\_\_ lbs
5. Shackle size \_\_\_\_\_ No. of shackles \_\_\_\_\_
6. Shackle rated capacity \_\_\_\_\_ lbs

7. Shackle secured to load by \_\_\_\_\_

8. Spreader beam capacity \_\_\_\_\_ lbs

#### F. Crane Placement

1. Any deviation from smooth, solid foundation? \_\_\_\_\_
- A. Distance to nearest overhead power line? \_\_\_\_\_
- B. Buildings, equipment, plant, or services to lift or swing over? \_\_\_\_\_
- C. Crane travel during lift? \_\_\_\_\_
- D. Swing direction? \_\_\_\_\_
- E. Will crane be set up away from excavations? \_\_\_\_\_  
(horizontal clearance shall be greater than hole depth)

#### G. Considerations

1. Multiple crane lifts require a separate plan for each crane.
2. Any changes in crane configuration, placement, rigging, lifting scheme, or calculations require that a new lift plan be developed
3. Number of taglines required to stabilize load \_\_\_\_\_
4. If other personnel or equipment, other than lift team and their equipment, are in close proximity to lift. Barricade and evacuate the lift area.
5. Check crane's operator manual for maximum wind speed a lift may be executed \_\_\_\_\_ mph.
6. Surface area of load should be considered for impact due to wind.
7. Method of communication between signal person and operator ☐ Radio ☐ Hand Signals

**Crane Operator:** I have been briefed of the contents of this lift plan and accept the duty of ensuring the lift is carried out to the agreed procedure, to the limits of my responsibilities.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**Lifting Supervisor:** I have been briefed of the contents of this lift plan and accept the duty of ensuring the lift is carried out to the agreed procedure.

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

## **APPENDIX G    SAMPLE SHARED SPACE AGREEMENT (CRANE)**

### **Shared Airspace Agreement**

(Date)

#### **GENERAL TERMS, DEFINITIONS AND BACKGROUND INFORMATION**

1. This **Shared Airspace Agreement** is between (Named Contractor) and (Named Contractor).
2. (Contractor) is operating a (crane model, type) crane at (Specific Location and Project Name) near the intersection of (street, intersection, city and state).
3. (Contractor) is operating a (crane model, type) crane at (Specific Location and Project Name) located near the intersection of (street, intersection, city and state).
4. The (Contractor's) (crane model, type) crane and the (Contractor's) (crane model, type) share a common or overlapping airspace with the potential for the two crane booms and/or associated rigging to collide.
5. The (Contractor) tower crane is positioned on an engineered foundation. The radius, swing or operational area of the tower crane cannot be adjusted or changed. The (Contractor's) crawler crane is mobile. The location of the (Contractor's) crawler crane can be altered, thereby changing the radius, swing or operation area of the crawler crane. Relocation of the (Contractor's) crawler crane may change or alter the size or location of the overlapping airspace of the two cranes.
6. Under normal operating conditions, assuming no shared, common or overlapping airspace, the (Contractor's) tower crane would weathervane (swing freely) during non-operating hours. The risk associated with the ability of the (Contractor's) tower crane to weathervane when not in operation is unacceptable whenever (Contractor) plans to work and (Contractor) is not operating or manning their tower crane.
7. Both the (Contractor) (crane model, type) crane and the (Contractor) (crane model, type) crane have established safe operating air speed limits for operation. The maximum air speed for safe operation of the (Contractor's) (crane model, type) crane is **(XX) miles per hour**. The maximum air speed for safe operation of the (Contractor's) (crane model, type) crane is **(XX) miles per hour**.
8. The (Contractor's) tower crane can be guyed off or tied down safely without placing any additional loads on the tower crane foundation at all air speeds below **(XX) miles per hour**. Guying off the tower crane when not in operation and ensuring that the boom is anchored outside the common or shared

airspace would allow (Contractor) to operate their crane without (Contractor) manning their tower crane.

9. All cranes in the State of (Name) are regulated by OSHA. Both (Contractor) and (Contractor) will operate their respective cranes within OSHA regulations at all times.
10. The (Contractor) crawler crane was in operation before the installation of the (Contractor) tower crane. (Contractor) requested and received prior approval from OSHA before installing the tower crane. The OSHA prior approval was conditioned upon both crane operators having instant, continuous, dedicated mobile communication at all times. OSHA was aware of the existence of the (Contractor) (crane model, type) crane and the shared airspace problem before giving approval to (Contractor) to install the (crane model, type).
11. After installation of the (Contractor) tower crane OSHA requested that both (Contractor) and (Contractor) sign a written agreement to ensure that both cranes would operate in the shared or common airspace safely. This original agreement was the (Contractor) letter to OSHA signed by both (Contractor) and (Contractor) and dated (Day-Month-Year).

#### **SPECIFIC TERMS TO INCLUDE OPERATING PROCEDURES**

1. (Contractor) and (Contractor) both agree that the (Contractor) letter to (Name) of OSHA dated (Day-Month-Year) is hereby null and void. This original agreement did not include a procedure for dealing with the excessive amount of overtime crane operations by (Contractor). The original agreement did not discuss the conditions under which the tower crane would weathervane. The operating procedures defined in the (Contractor) letter to OSHA dated (Day-Month-Year) are hereby replaced by the operating procedures in this Shared Airspace Agreement. This Shared Airspace Agreement has been reviewed and approved by OSHA.
2. When both cranes are in operation at the same, time both crane operators will have instant, continuous, dedicated mobile communication. Before either crane approaches the shared or common airspace the other crane operator must provide clearance. If any doubt or confusion exists, the crane operator will not enter or even approach the shared airspace. (Contractor) and (Contractor) agree to allow both operators to communicate, share information and work together to ensure safe crane operations for both companies.

3. (Contractor) and/or (Contractor) will not, under any circumstances, operate their crane when the air speed exceeds the safe operating air speed for that crane. (Reference Line Item # 7)
4. (Contractor) will place the boom of their tower crane outside the shared or common airspace at the end of every work shift. (Contractor) will guy off or secure the boom in this safe location allowing (Contractor) to operate within the shared airspace without (Contractor) manning their tower crane. (Contractor) must release the guying cables and allow the tower crane to weathervane (swing freely) when air speeds exceed (XX) miles per hour.
5. (Contractor) will place the boom of their crane well beyond or outside the shared airspace at the end of every work shift. Although the Sumitomo SC 1500 crawler crane does not weathervane, (Contractor) is responsible for ensuring that their crane boom remains outside the shared airspace whenever their crane is not manned or in operation.
6. (Contractor) will install and monitor an air speed indicator on their tower crane. (Contractor) will confirm the weather report before leaving the jobsite after each work shift. (Contractor) will provide air speed and/or weather forecast information to (Contractor) upon request. The intent is to communicate weather information that may predict air speeds and/or weather conditions that are unsafe for continued crane operations. (Contractor) cannot operate their crane under extreme weather conditions. (Contractor) cannot guy off or secure their tower crane under extreme weather conditions.
7. Before the end of every (Contractor) work shift the (Contractor) superintendent will review the current air speed and weather forecasts. If these weather reports and/or air speed monitor(s) indicate or forecast that weather conditions may deteriorate and cause air speeds in excess of (XX) miles per hour (the maximum safe operating air speed for the {Contractor} mobile crane) Contractors will discuss their intention to continue crane operations under these severe weather conditions.
8. (Contractor) or (Contractor) may decide to start operating their crane when the other company is not manning their crane. This may happen during overtime conditions to include weekday nights, weekends or holidays. If either (Contractor) or (Contractor) commences crane operations when the other crane is not manned, they must confirm that the other crane is safely outside the shared or common airspace. DO NOT ASSUME THAT THE OTHER CRANE IS GUYED OFF, SECURED OR OUTSIDE THE SHARED AIRSPACE AREA BEFORE STARTING CRANE OPERATIONS. A simple visual inspection will confirm that the (Contractor) tower crane is safely guyed off and secured. The guying cables are

clearly visible and (Contractor) can easily confirm that the guyed off and secured tower crane will remain outside the shared or common airspace. Confirmation that the (Contractor) tower crane is safely guyed off before commencing an overtime (Contractor) shift is important given that the (Contractor) tower crane has the potential to weathervane into the shared or common airspace. Confirmation that the (Contractor) tower crane is safely guyed off and secured is critical after a major storm has passed through the area. A major storm may have forced (Contractor) to release the guyed cables and allow the tower crane to weathervane. (Contractor) will also ensure that the (Contractor) crane is safely outside the shared airspace area before commencing crane operations.

9. Under normal weather conditions (Contractor) agrees to take all actions necessary to ensure that their tower crane is safely guyed off and secured; and out of the shared or common airspace when their tower crane is not manned. (Contractor) must release the guying cables and allow the tower crane to weathervane when air speeds approach (XX) miles per hour.
10. Both (Contractor) and (Contractor) agree to provide the other party to this Shared Airspace Agreement with advance written notification of any change to crane configuration, size, location or operation that may possibly impact the size or location of the shared airspace zone.
11. Both parties to this Shared Airspace Agreement reserve the right to contact OSHA if the other party violates the letter or intent of this Shared Airspace Agreement. OSHA has the authority to shut down one or both cranes. Both parties agree to work together to ensure a safe operating environment for both cranes. A copy of this fully executed Shared Airspace Agreement will be provided to OSHA.
12. This Shared Airspace Agreement will remain in effect until either (Contractor) or (Contractor) permanently remove their crane(s) from their jobsite thereby eliminating any shared airspace problem.
13. This Shared Airspace Agreement can only be modified in writing. Any changes must be agreed to, signed by both parties to this agreement.

**ACCEPTED AND AGREED:**

---

(Contractor) Joint Venture

Date

---

(Contractor)

Date

## APPENDIX H SUSPENDED PERSONNEL PLATFORM CHECKLIST

### SUSPENDED PERSONNEL PLATFORM CHECKLIST

|                                                                                                                                                                                                                                                                                   |           |                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Date                                                                                                                                                                                                                                                                              |           | Competent Person:                                                                                                                                                                                       |
| Crane Make:                                                                                                                                                                                                                                                                       | Model:    | Serial Number:                                                                                                                                                                                          |
| Equipment Number:                                                                                                                                                                                                                                                                 | Hours:    | Crane Capacity:                                                                                                                                                                                         |
| Crane Type:                                                                                                                                                                                                                                                                       | Hydraulic | Conventional                                                                                                                                                                                            |
| <b>(1.) CRANE REQUIREMENTS</b>                                                                                                                                                                                                                                                    |           |                                                                                                                                                                                                         |
| Contractors and/or users must ensure that all items in this checklist are satisfied, including compliance with all safety requirements prior to making a lift. All precautions and instructions on the decals attached to the crane and the platform must be strictly adhered to. |           |                                                                                                                                                                                                         |
| <b>Circle Items "Yes" to verify compliance:</b>                                                                                                                                                                                                                                   |           |                                                                                                                                                                                                         |
| No                                                                                                                                                                                                                                                                                | Yes       | Use of a manbasket is the safest and most practical way to accomplish the task.                                                                                                                         |
| No                                                                                                                                                                                                                                                                                | Yes       | All crane inspections are current per ANSI B30.5 requirements.                                                                                                                                          |
| No                                                                                                                                                                                                                                                                                | Yes       | All hooks have a current inspection per ANSI B30.10 and have positive locking type hook latches.                                                                                                        |
| No                                                                                                                                                                                                                                                                                | Yes       | The correct load chart is with the crane and the operator is thoroughly familiar with all special notes and manufacturer recommendations given on the chart.                                            |
| No                                                                                                                                                                                                                                                                                | Yes       | All operational aids and safety devices in the crane are functioning and the operator is fully versed in their operation.                                                                               |
| No                                                                                                                                                                                                                                                                                | Yes       | The load lines have a 7:1 safety factor (10:1 when using non-spin rope). NOTE: This is achieved by a 50 percent de-rating of the crane load chart.                                                      |
| No                                                                                                                                                                                                                                                                                | Yes       | The crane is on firm footing and the crane outriggers are all the way out, down, and locked as applicable.                                                                                              |
| No                                                                                                                                                                                                                                                                                | Yes       | The crane is level within 1 percent, (1 foot in 100 feet) and is on firm surface. NOTE: Stability of the footing will be verified during the full cycle of the operation test.                          |
| No                                                                                                                                                                                                                                                                                | Yes       | Means have been provided to enable the operator to ensure that the crane is level.                                                                                                                      |
| No                                                                                                                                                                                                                                                                                | Yes       | A firm, level surface has been prepared and designated as a "runway" or path of travel for the weight and configuration of the crane begin used.                                                        |
| No                                                                                                                                                                                                                                                                                | Yes       | The crane counterweights are per manufacturer specification.                                                                                                                                            |
| No                                                                                                                                                                                                                                                                                | Yes       | All load lines are properly revved and laying properly on the drums.                                                                                                                                    |
| No                                                                                                                                                                                                                                                                                | Yes       | All drum hoists have full control load lowering. NOTE: Free fall is not to be used.                                                                                                                     |
| No                                                                                                                                                                                                                                                                                | Yes       | The boom is fully powered up and down, live boom is not to be used.                                                                                                                                     |
| No                                                                                                                                                                                                                                                                                | Yes       | The boom angle and radius indicator works. NOTE: Measure radius with tape measure on conventional cranes.                                                                                               |
| No                                                                                                                                                                                                                                                                                | Yes       | The boom length indicator on telescoping booms is fully functional.                                                                                                                                     |
| No                                                                                                                                                                                                                                                                                | Yes       | The positive anti two-block device is functioning properly. NOTE: A warning system alone does not suffice.                                                                                              |
| <b>(2.) RIGGING REQUIREMENTS</b>                                                                                                                                                                                                                                                  |           |                                                                                                                                                                                                         |
| No                                                                                                                                                                                                                                                                                | Yes       | Each bridle leg is connected to the master link, or shackle in a way that ensures the load is evenly distributed between all the bridle legs.                                                           |
| No                                                                                                                                                                                                                                                                                | Yes       | All rigging, wire rope, shackles, rings, master links, and other rigging hardware, have a minimum safety factor of 5:1. NOTE: When non-spin cable is used, a minimum safety factor of 10:1 is required. |
| No                                                                                                                                                                                                                                                                                | Yes       | All wire rope eye fittings are provided with thimbles.                                                                                                                                                  |
| No                                                                                                                                                                                                                                                                                | Yes       | All load hooks are closed with locking type latches.                                                                                                                                                    |
| No                                                                                                                                                                                                                                                                                | Yes       | All rigging equipment for the manbasket is exclusively for that use only.                                                                                                                               |
| No                                                                                                                                                                                                                                                                                | Yes       | All rigging has been inspected for kinks or damage of any kind.                                                                                                                                         |
| No                                                                                                                                                                                                                                                                                | Yes       | Shackle pins are of the nut-with-pin-retainer-type.                                                                                                                                                     |



| (3.) MANBASKET REQUIREMENTS |     |                                                                                                                                                                                                                                                                                                         |
|-----------------------------|-----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No                          | Yes | The basket has been designed with a 5:1 safety factor by a qualified engineer and welded by a qualified welder.                                                                                                                                                                                         |
| No                          | Yes | The suspension rigging system has been designed in such a way as to minimize tipping of the manbasket.                                                                                                                                                                                                  |
| No                          | Yes | The maximum rated load and maximum capacity is posted on a permanently affixed plate on the manbasket.                                                                                                                                                                                                  |
| No                          | Yes | The guardrail designed to enclose the platform is provided and is enclosed from the toeboard to the mid-rail.                                                                                                                                                                                           |
| No                          | Yes | Body harness anchorage provided.                                                                                                                                                                                                                                                                        |
| No                          | Yes | The access gate has been designed to open in and is positively prevented from swinging outward while the manbasket is in use.                                                                                                                                                                           |
| No                          | Yes | The access gate must have a positive locking system to prevent accidental opening during operation.                                                                                                                                                                                                     |
| No                          | Yes | The design allows enough headroom for employees to stand upright.                                                                                                                                                                                                                                       |
| No                          | Yes | There are no rough edges on any manbasket surface.                                                                                                                                                                                                                                                      |
| No                          | Yes | In addition to hard hats, overhead protection is provided when employees are exposed to falling objects.                                                                                                                                                                                                |
| No                          | Yes | A trial-lift meeting has been attended by the crane or derrick operator, signal person(s) (if necessary for the lift), employee(s) to be lifted, and the employee responsible for the task to be performed                                                                                              |
| No                          | Yes | Precautions have been taken to protect employees from any special hazards in the area where the crane and manbasket will be operating; for example, power lines or areas where the manbasket will be out of the operator's view.                                                                        |
| No                          | Yes | Special precautions have been taken to protect personnel from electrical hazards. When the crane with a manbasket is working near electrical lines or devices, the minimum working clearances shall be at least twice those for material handling operations.                                           |
| No                          | Yes | A manbasket use authorization has been issued dated and properly signed for the task at hand.                                                                                                                                                                                                           |
| No                          | Yes | The manbasket and rigging has been proof-tested to 125 percent of the platform rated capacity.                                                                                                                                                                                                          |
| No                          | Yes | An unoccupied trial lift loaded to at least the anticipated lift weight has been performed and hoisted to each location where work is to be performed, or to any point where employees are expected to enter or exit the platform. NOTE: The trial lift must be performed each time the crane is moved. |
| No                          | Yes | A post trial-lift inspection of the crane has been carried out by a designated employee.                                                                                                                                                                                                                |
| No                          | Yes | The loading is less than 50 percent of the crane-rating chart for all work locations.                                                                                                                                                                                                                   |
| No                          | Yes | The operator has determined that all systems, controls, and safety devices are activated and functioning properly and that no interferences exist.                                                                                                                                                      |
| No                          | Yes | The manbasket has been hoisted a few inches and has been re-inspected after the trial lift for any deficiencies.                                                                                                                                                                                        |
| No                          | Yes | Prior to hoisting personnel, the manbasket has been hoisted a few inches to verify its hang level.                                                                                                                                                                                                      |
| No                          | Yes | All hoist ropes are free of kinks.                                                                                                                                                                                                                                                                      |
| No                          | Yes | Multipart lines are not twisted around each other.                                                                                                                                                                                                                                                      |
| No                          | Yes | The hook is centered over the load.                                                                                                                                                                                                                                                                     |
| No                          | Yes | The hoist lines are laying properly on hoist drums and in the sheaves.                                                                                                                                                                                                                                  |
| No                          | Yes | All post trial lift defects have been corrected.                                                                                                                                                                                                                                                        |
| No                          | Yes | The crane-bearing surface has been rechecked and crane re-leveled as required.                                                                                                                                                                                                                          |
| No                          | Yes | Have the crane safety components, dogs, pawls, brakes, etc., have been re-inspected after the trial lift.                                                                                                                                                                                               |
| No                          | Yes | Travel with the crane is not permitted except where all requirements are satisfied and where not to do so would endanger life                                                                                                                                                                           |
| No                          | Yes | The operator has been advised that the load and boom hoist drum brakes, swing brakes, and locking devices such as pawls or dogs must be engaged when the occupied personnel platform is in a stationary working position.                                                                               |
| No                          | Yes | The operator has been advised that the platform must be hoisted in a slow, controlled, cautious manner with no sudden movement of the crane, derrick or platform.                                                                                                                                       |
| No                          | Yes | The operator has been advised that the platform must be hoisted in a slow, controlled, cautious manner with no sudden movement of the crane, derrick or platform.                                                                                                                                       |
| No                          | Yes | Employees have been advised to perform tasks specified in the manbasket authorized only. NOTE: Only the number of employees needed for the task at hand is allowed to be hoisted.                                                                                                                       |
| No                          | Yes | All employees have been advised to keep all body parts inside the platform during raising. NOTE: This provision does not apply to an occupant of the platform performing the duties of a signal person.                                                                                                 |
| No                          | Yes | All employees have been advised that they are not allowed to enter or exit the platform when it is secured to the structure where the work is to be performed unless securing to the structure creates an unsafe situation.                                                                             |
| No                          | Yes | All employees have been advised that they are not allowed to exit the platform before landing.                                                                                                                                                                                                          |
| No                          | Yes | All employees have been advised that taglines must be used unless their use would create an unsafe condition.                                                                                                                                                                                           |
| No                          | Yes | The operator has been advised to remain at the controls at all times while the crane engine is running and the platform is occupied.                                                                                                                                                                    |
| No                          | Yes | All employees have been advised that platform use must be promptly discontinued if there is any indication of dangerous weather conditions or other impending danger.                                                                                                                                   |
| No                          | Yes | The operator is in constant contact by standard hand signals or voice communications during operation of crane and manbasket.                                                                                                                                                                           |
| No                          | Yes | All employees have been advised to remain in continuous sight of or in direct communication with the operator or signal                                                                                                                                                                                 |

|    |     |                                                                                                                                                                                                                                                                                                           |
|----|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |     | person.                                                                                                                                                                                                                                                                                                   |
| No | Yes | All employees have been advised that the use of a radio is permissible when direct visual contact is not possible, or where the use of a signal person could create a greater hazard.                                                                                                                     |
| No | Yes | All employees occupying the platform have been advised to wear a body belt or harness system, with the lanyard appropriately attached to the lower load block, overhaul ball, or structural member within the personnel platform capable of supporting the fall impact for employees using the anchorage. |
| No | Yes | All employees have been advised to wear a life vest when working over water.                                                                                                                                                                                                                              |
| No | Yes | Employees have been advised to secure materials and tools to prevent displacement during the lift.                                                                                                                                                                                                        |
| No | Yes | All employees have been advised to load the manbasket evenly and to only carry tools and materials needed for the task at hand.                                                                                                                                                                           |
| No | Yes | The operator, and all employees that will be using the platform, have been advised that no other object may be lifted on any of the crane load lines while the platform is suspended.                                                                                                                     |
| No | Yes | An audible and visual device has been provided to the personnel in the platform so that they can signal for assistance in the event of an emergency.                                                                                                                                                      |
| No | Yes | Personnel have been advised to stand firmly on the floor of the platform and to not sit or climb on the edge of the platform or use planks, ladders, or other devices for attaining a work position.                                                                                                      |
| No | Yes | If welding is to be performed by employees occupying the platform, the electrode must be protected from touching the metal components of the platform.                                                                                                                                                    |
| No | Yes | Any needed repairs to the crane or manbasket used only original manufacturer parts to ensure that the new components are compatible with their original counterparts.                                                                                                                                     |
| No | Yes | Care taken to prevent ropes, electrical chords, and hoses from becoming entangled in the platform when the platform is being moved.                                                                                                                                                                       |
| No | Yes | Operator aids or interlocks have not been altered, modified, or disabled in any way.                                                                                                                                                                                                                      |
| No | Yes | The crane operator responsible for operating the cranes used for personnel handling is a thoroughly trained operator and has related experience operating the subject crane.                                                                                                                              |
| No | Yes | All manuals, operating instructions, and load charts provided have been read and understood by the operating personnel prior to starting the operation.                                                                                                                                                   |
| No | Yes | The operator has ensured that the area surrounding the platform is clear of personnel and equipment before moving the platform.                                                                                                                                                                           |
| No | Yes | Prior to the trial lift at each new location, a pre-lift meeting has been held, and is also held for any new employee assigned to the manbasket.                                                                                                                                                          |
| No | Yes | All deficiencies discovered in post trial-lift inspection have been corrected.                                                                                                                                                                                                                            |
| No | Yes | All employees attending the pre-lift meeting signed the roster for the meeting.                                                                                                                                                                                                                           |
| No | Yes | The trial-lift calculation sheet has been completed, signed and dated.                                                                                                                                                                                                                                    |

**(4.) PERSONNEL PLATFORM WEIGHT CALCULATION SHEET**

- Platform Rated Capacity \_\_\_\_\_
- 125 Percent Proof Test \_\_\_\_\_  
*(NOTE: Suspended load for 5 minutes)*
- Number of Occupants x 250 lb. each \_\_\_\_\_
- Tools plus materials in platform \_\_\_\_\_
- Misc. weight not otherwise listed \_\_\_\_\_
- Tare Weight of Platform Plus Rigging \_\_\_\_\_
- Total Occupied Weight of Platform \_\_\_\_\_
- Hoist Line Cable Weight: \_\_\_\_\_
- Headache Ball Weight \_\_\_\_\_
- Load Block Weight \_\_\_\_\_
- Rooster Sheave Weight \_\_\_\_\_
- Effective JIB Weight: \_\_\_\_\_
- (If Hoisting on Main Loadline) \_\_\_\_\_
- JIB Weight Stowed \_\_\_\_\_
- Misc. Weight Not Otherwise Listed \_\_\_\_\_
- Total Load Chart Deductions \_\_\_\_\_
- Total Weight, "W" (Total Load Chart Deductions Plus) \_\_\_\_\_
- Total Occupied Weight of Platform \_\_\_\_\_
- Capacity of Crane at Minimum Radius \_\_\_\_\_
- Capacity of Crane at Platform Work Radius \_\_\_\_\_
- 50 Percent of Crane Capacity at Minimum Radius \_\_\_\_\_
- 50 Percent of Crane Capacity at Platform Working Radius \_\_\_\_\_
- Total Load, "W" Divided by 50 Percent Crane Rating=Percent of De-rated Capacity Used \_\_\_\_\_

Cr Operator Signature \_\_\_\_\_

Rigger Signature: \_\_\_\_\_

Lift Supr Signature: \_\_\_\_\_

## APPENDIX I VISITOR'S WAIVER AND RELEASE

The Department of Aviation is pleased to welcome you to this project. Because of the hazards and risks associated with this construction site, we require every visitor to the Site to be alert for his/her own safety and to sign a written Waiver and Release absolving the Owner and others associated with this project of any and all responsibility in connection with all risks encountered at the Site. While on the Construction Premises, please be on guard constantly and follow good safety practices including, but not limited to, the following:

1. Hard-hats, safety glasses and high visibility vests must be worn by all visitors at all times.
2. Although work boots are not required, all visitors shall wear low-heeled leather shoes. High heels of any kind or open-toed sandals are not permitted.
3. All visitors are to be escorted at all times by a badged employee while on the Project Site.
4. Display visitor's badge on the outer garment at all time
5. BE ALERT for changing conditions and ongoing construction activities while walking on the Project Site. LOOK and LISTEN before you move from one position to another.
6. Be aware of uneven walking surfaces and extreme care shall be taken with each step.
7. No firearms, drugs or alcoholic beverages are permitted on the site.
8. All warning signs and barricades must be obeyed.
9. Do not stray from the approved path for ingress and egress.
10. Do not enter areas with inadequate lighting.
11. Be aware of and stay clear of any overhead hazards.
12. Smoking is only permitted in designated areas.
13. Do not touch construction materials of any kind without written authorization from the **Program Manager**.
14. Do not lean on or reach beyond any handrails or barricades.
15. Report any hazards to the **Program Manager** prior to leaving the site.
16. No written correspondence regarding any hazards observed on the site shall be written or forwarded after leaving the site unless previously agreed upon at the site.
17. Call 303-342-4211 in the event of an emergency

I agree to abide by the Instructions set forth above.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Visitor's Signature

# VISITOR

NAME: \_\_\_\_\_

COMPANY: \_\_\_\_\_

NAME OF COMPANY/PERSON VISITING: \_\_\_\_\_

DATE: \_\_\_\_\_

## **WAIVER AND RELEASE**

In consideration of granting the undersigned permission to enter upon the premises at the Project and for other good and valuable consideration, I hereby waive and forever discharge the Owner, Owner's representatives, Program Manager, Construction Manager, all Subcontractors on the project (the "Released Parties") from and against any claim for damages that may arise due to injury to my person or property while on the project whether caused in whole or in part by any negligence, actions or inactions of the Released Parties. As a licensee, I assume the risk of all dangerous conditions on or about the premises and waive notice of the existence of any such conditions.

I acknowledge the confidential nature of the Owner construction procedures and processes and agree not to photograph, reproduce or divulge the same without the written consent of the Owner.

I HAVE READ THE ABOVE AND AGREE TO SAME:

Signature: \_\_\_\_\_

Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_

Escort's First and Last Name: \_\_\_\_\_

Escort's Badge No.: \_\_\_\_\_

## APPENDIX J      *SAMPLE HEAT ILLNESS PROGRAM*

---

**(Name of Company)**

### **Heat Illness Policy and Procedure**

The company recognizes that during certain times of the year employees may be exposed to working in excessive temperatures which may create the risk of heat stress and illness. Acknowledging this exposure, the company has established a “Heat Illness Policy and Procedure” plan to educate and monitor employees from heat-related illness.

Employees are responsible for following these guidelines and maintaining a healthy nutritional balance.

Employees shall be monitored by foremen and superintendents, especially during the first few days of hot work seasons for signs of heat illness.

As a part of our orientation, employees shall be made aware of signs of heat stress and potential illness. Employees shall be made aware of acclimatization which is the process whereby a person gradually adapts to work in the heat when the exposure exists. Acclimatization peaks in most people within four to fourteen days of regular work for at least two hours per day in the heat.

It is the policy of (Name of Company) is to comply with at least the minimum requirements established by State and Federal agencies with respect to preventing our employees from heat illness.

### **A. Training**

1. Effective training in the following topics shall be provided to all supervisory and non-supervisory employees before the employee begins work that should reasonably be anticipated to result in exposure to the risk of heat illness:
  - a. The environmental and personal risk factors for heat illness;
  - b. The company’s procedures for complying with the requirements of the heat illness standard;
  - c. The importance of frequent consumption of small quantities of water, up to 4 cups per hour, when the work environment is hot and employees are likely to be sweating more than usual in the performance of their duties;
  - d. The importance of acclimatization;
  - e. The different types of heat illness and the common signs and symptoms of heat illness;
  - f. The importance to employees of immediately reporting to their foreman or superintendent, symptoms or signs of heat illness in themselves, or with co-workers;
  - g. The company’s procedures for responding to symptoms of possible heat illness, including how emergency medical services will be provided should they become necessary;
  - h. The company’s procedures for contacting emergency medical services, and if necessary, for transporting employees to a point where they can be reached by an emergency medical service provider;

- i. The company's procedures for ensuring that, in the event of an emergency, clear and precise direction to the work site can and will be provided as needed to emergency responders.
2. The company shall provide supervisory training prior to assignment to supervision of employees working in the heat. Training will be provided on the following topics:
  - a. Information covered in A (1) "a." through "i." in this policy as described above.
  - b. The procedures a supervisor is to follow to implement the applicable parts in this policy.
  - c. The procedures a supervisor will follow when an employee exhibits symptoms consistent with possible heat illness, including emergency response procedures.

## **B. Water**

1. Employees shall have access to potable drinking and meet the following requirements:
  - a. Where water for consumption is not plumbed or otherwise continuously supplied, it shall be provided in sufficient quantity at the beginning of the work shift to provide one quart per employee per hour for drinking for the entire shift.
  - b. The shift may begin with smaller quantities of water if the project has effective procedures for replenishment during the shift as needed to allow employees to drink one quart or more per hour.
  - c. The frequent drinking of water shall be encouraged.
  - d. Water containers shall be sealed to prevent contamination.
  - e. A designated person shall check the water level of containers every thirty minutes and more frequently when the temperature exceeds 90 degrees. When the water level drops below 50%, the container shall be refilled with cool water. To accomplish this task the designated person will carry additional water containers to replace the water.
  - f. When the temperature exceeds 90 degrees, the designated person will carry ice in separate containers so that when necessary, it will be added to the drinking water to keep it cool.
  - g. The designated person will bring paper cone rims or bags of disposable cups and the necessary cup dispensers to ensure that enough disposable cups are made available for each worker and are kept clean until used.
  - h. The designated person will check the work site and place the water as close as possible to the workers (i.e. no more than 50 feet from the workers). If field terrain prevents the water from being placed as close as possible to the workers, the designated person will bring bottled water or individual containers (in addition to disposable cups and water containers), so that workers can have drinking water readily accessible. The designated person will ensure that the water containers are relocated to follow along as the crew moves.
  - i. The designated person will point out daily the location of the water coolers to the workers and remind them to drink water frequently. When the temperature exceeds or is expected to exceed 90 degrees, the designated person will hold a brief 'tailgate' meeting each morning to review with employees the importance of drinking water, the number and schedule of water and rest breaks and the signs
  - j. When the temperature equals or exceeds 95 degrees Fahrenheit or during a heat wave, the designated person will increase the number of water breaks, and will remind workers throughout the work shift to drink water.

### C. Shade

1. Employees suffering from heat illness or believing a preventative recovery period is needed, shall be provided access to an area with shade that is either open to the air or provided with ventilation or cooling for a period of no less than five minutes. When the outdoor temperature in the work area does not exceed 85 degrees Fahrenheit (Company Name) shall either provide shade as per (a) below or provide timely access to shade upon an employee's request.
  - a. Access to shade shall be permitted at all times when the temperature exceeds 85 degrees. When the outdoor temperature in the work area exceeds 85 degrees, (Company Name) shall have and maintain one or more areas with shade at all times while employees are present that are either open to the air or provided with ventilation or cooling. The amount of shade present shall be at least enough to accommodate 25% of the employees on the shift at any time, so that they can sit for at least 5 (five) minutes in a normal posture, fully in the shade without having to be in physical contact with each other or direct contact with the ground. Chairs, benches, sheets or towels shall be provided for seating. The shaded area shall be located as close as practicable to the areas where employees are working.
  - b. Cooling measures other than shade (e.g., use of misting machines) may be provided in lieu of shade if the company or project can demonstrate that these measures are at least as effective as shade in allowing employees to cool.
  - c. Employees are allowed and encouraged to take a cool-down rest in the shade for a period of no less than five minutes at a time when they feel the need to do so to protect themselves from overheating.
  - d. In situations where trees, vegetation or structures may be used to provide shade, the designated person will evaluate the thickness and shape of the shaded area (given the changing angles of the sun during the entire shift), before assuming that sufficient shadow is being cast to protect employees.
  - e. In situations where it is not safe to provide shade (example winds of more than 40 mph), the designated person will document how this determination was made, and what steps will be taken to provide shade upon request.
  - f. In situations where it is not safe or feasible to provide shade, the designated person will document how this determination was made, and what steps will be taken to provide shade upon request or other alternative cooling measures with equivalent protection.

### D. Monitoring the Weather

1. Procedures for monitoring the weather shall include but not be limited to the following:
  - a. Two weeks in advance (or with as many days in advance as possible), (Company Name) Superintendent will go on the internet ([www.nws.noaa.gov](http://www.nws.noaa.gov)), call the National Weather Service or check the Weather Channel TV Network to view the extended weather forecast in order to plan in advance the work schedule, know whether a heat wave is expected and if additional schedule modifications will be necessary. This type of advance planning shall take place in the Summer months.
  - b. Prior to each workday, the designated person will review the forecasted temperature and humidity for the worksite and compare it against the National Weather service Heat Index to evaluate the risk level for heat illness, for instance whether or not workers will be exposed at a temperature and humidity characterized as either "extreme caution" or "extreme danger" for heat illnesses such as heat stroke. It is important to keep in mind that



the temperature at which these warnings occur must be lowered as much as 15 degrees if the workers under consideration are in direct sunlight.

- c. Prior to each workday, the designated person will be responsible for monitoring the weather (using [www.nws.noaa.gov](http://www.nws.noaa.gov) or with the aid of a simple thermometer) at the worksite. This critical weather information will be taken into consideration, to determine when it will be necessary to make modifications to the work schedule (such as stopping work early, rescheduling the job, working at night or during the cooler hours of the day, increasing the number of water and rest breaks).
- d. The designated person will be responsible for using a thermometer at the jobsite and checking the temperature every 60 minutes to monitor for sudden increases in temperature, to ensure that once the temperature exceeds 85 degrees, the shade structures are opened and accessible to the workers and to make certain that once the temperature equals or exceeds 95 degrees additional preventive measures such as the High Heat Procedures are implemented as described in Part E of this document.

#### **E. High-Heat Procedures.**

- 1. (Company) shall implement high-heat procedures when the temperature equals or exceeds 95 degrees. These procedures shall include the following to the extent practicable:
  - a. Ensuring that effective communication by voice, observation, or electronic means is maintained so that employees at the work site can contact a supervisor when necessary. An electronic device, such as a cell phone or text messaging device, may be used for this purpose only if reception in the area is reliable.
  - b. Observing employees for alertness and signs or symptoms of heat illness.
  - c. Reminding employees throughout the work shift to drink plenty of water.
  - d. Close supervision of a new employee by a supervisor or designee for the first 14 days of the employee's employment by the employer, unless the employee indicates at the time of hire that he or she has been doing similar outdoor work for at least 10 of the past 30 days for 4 or more hours per day.

#### **F. Clothing**

- 1. Employees should wear clothing appropriate for the work they are performing and should follow these guidelines:
  - a. Wear light-colored clothing of a fabric that is permeable to the air, such as cotton. Most synthetic materials do not provide adequate ventilation.
  - b. Generally, less clothing is desirable in hot environments, except when the air temperature exceeds 95 degrees Fahrenheit or when a person is standing next to a radiant heat source or exposed to the sun; in those instances, covering exposed skin is beneficial to reducing heat stress and sunburn.
  - c. Shorts are not permitted. Shirt sleeves will extend at least four inches in length. Tank tops and sleeveless shirts are not permitted. The Project Safety Specific Safety Plan may address additional requirements.

#### **G. Emergency Response:**

1. The procedures for emergency response and handling the sick are as follows but not limited to these guidelines.
  - a. Prior to assigning a crew to a particular worksite, the designated person will provide workers and the foreman a map along with clear and precise directions (such as streets or road names, distinguishing features and distances to major roads) of the site, to avoid a delay of emergency medical services.
  - b. Prior to assigning a crew to a particular worksite, the designated person will ensure that a qualified, appropriately trained and equipped person will be available at the site, to render first aid if necessary.
  - c. Prior to the start of the shift, the designated person will determine if a language barrier is present at the site and take steps to ensure that emergency medical services can be immediately called in the event of an emergency.
  - d. All foremen and supervisors will carry cell phones or other means of communication, to ensure that emergency medical services can be called and check that these are functional at the worksite prior to each shift.
  - e. When an employee is showing symptoms of possible heat illness, the designated person will take immediate steps to keep the stricken employee cool and comfortable once emergency service responders have been called (this will be done to reduce the progression to more serious illness).
  - f. At remote locations or undeveloped areas, the designated person will assign an employee or employees to physically go to the nearest road or highway where they can be seen by emergency responders. If daylight is diminished, the designated employee(s) shall be issued a high visibility Type 2 or Type 3 vest, a vehicle (if necessary), and flashlights in order to direct emergency personnel to the location of the worksite, which may not be visible from the road or highway.
  - g. (Company Name) training for employees and supervisors will include every detail of these written emergency procedures.
2. Managing a sick employee or one who displays possible signs or symptoms of heat illness, the following procedures shall be used:
  - a. A trained first aid worker or supervisor will check the sick employee and determine whether resting in the shade and drinking cool water will suffice or if emergency service providers will need to be called.
  - b. The sick worker shall not be left alone in the shade, as he or she can take a turn for the worse.
  - c. While the ambulance is in route, initiate first aid (cool the worker: place in the shade, remove excess layers of clothing, place ice pack in the armpits and join area and fan the victim).
  - d. A sick worker shall not be permitted to leave the site (unless being transported by ambulance or treatment has been started by paramedics) until they have been evaluated by an EMT or physician and released to return to work.
  - e. If an employee does not look OK and displays signs or symptoms of severe heat illness (loss of consciousness, incoherent speech, convulsions, red and hot face), and the worksite is located more than 20 min away from a hospital, call emergency service providers, communicate the signs and symptoms of the victim and request Air Ambulance.

- f. Treatment for heat cramps – Have the person rest in a cool place and provide cool water. Usually rest and fluids are all the person will need to recover. Lightly stretch the muscle and massage the area. When cramps stop, the person can usually start activity again if there are no other signs of illness. He or she should keep drinking plenty of fluids. Watch the person carefully for further signs of heat illness.
- g. Treatment for Heat Exhaustion and Heat Stroke – When you recognize heat-related illness in its early stages, you can usually reverse it. Get the person out of the heat. Loosen any tight clothing and apply cool, wet cloths, such as towels or sheets, taking care to remoisten the cloths periodically. Spraying the person with water and fanning is also beneficial. If the person is conscious, give them small amounts of cool water to drink.

Do not let a conscious person drink too quickly. Give about 4 ounces of water every 15 minutes. Let the person rest in a comfortable position and watch carefully for changes in their condition. The person should not resume normal activities the same day.

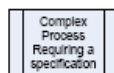
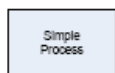
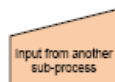
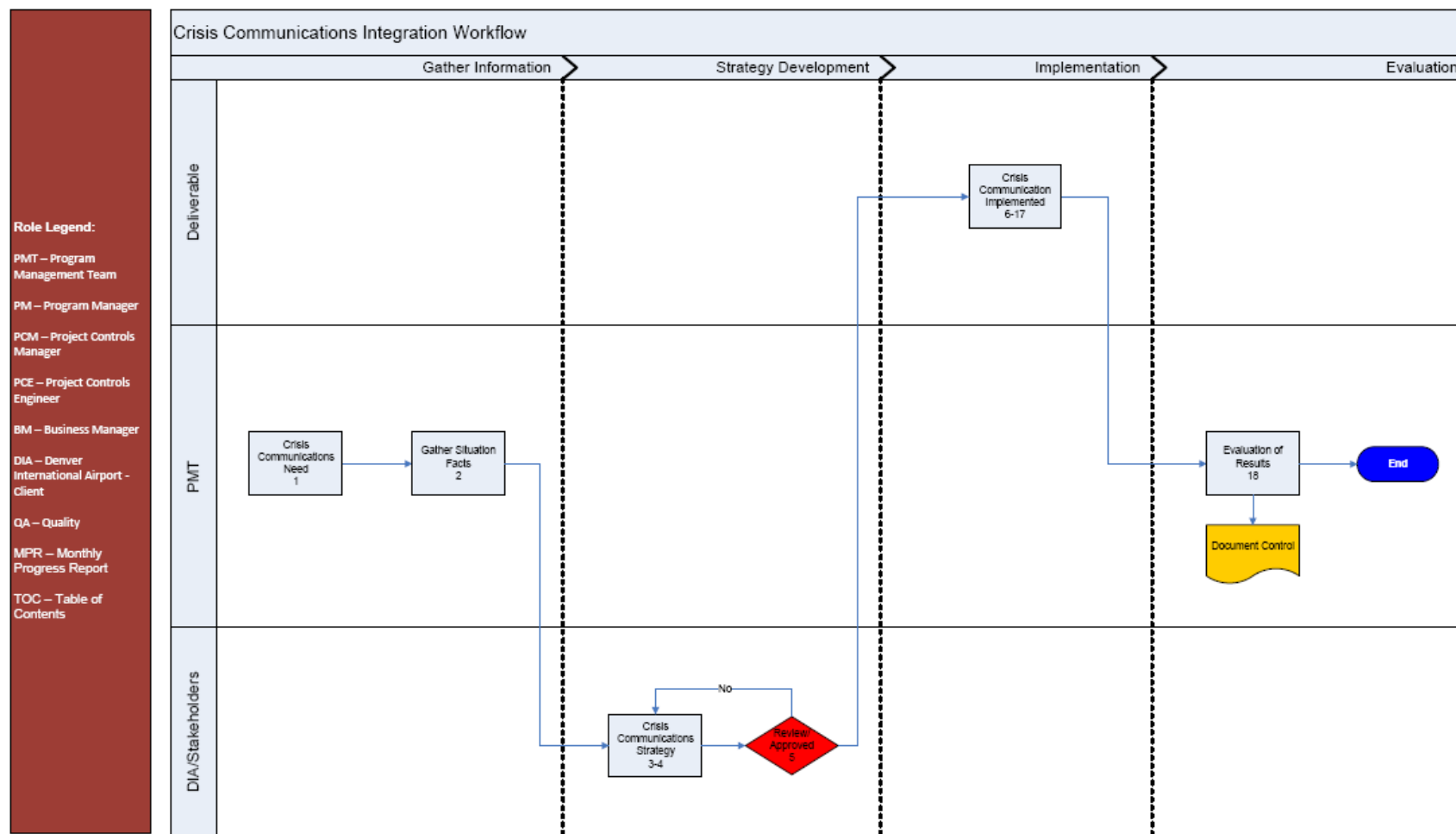
Refusing water, vomiting and changes in consciousness mean that the persons' condition is getting worse. Call 303-342-4211 immediately if you have not already done so. If the person vomits, stop giving fluids and place the person on their side. Watch for signs of breathing problems. Keep the person lying down and continue to cool the body any way you can. If you have ice packs or cold packs, place them on each of the persons' wrists and ankles, on the groin, in each armpit and on the neck to cool the large blood vessels. Use barriers, like towels or clothing, between the ice packs and the person to protect the skin.

## H. Definitions

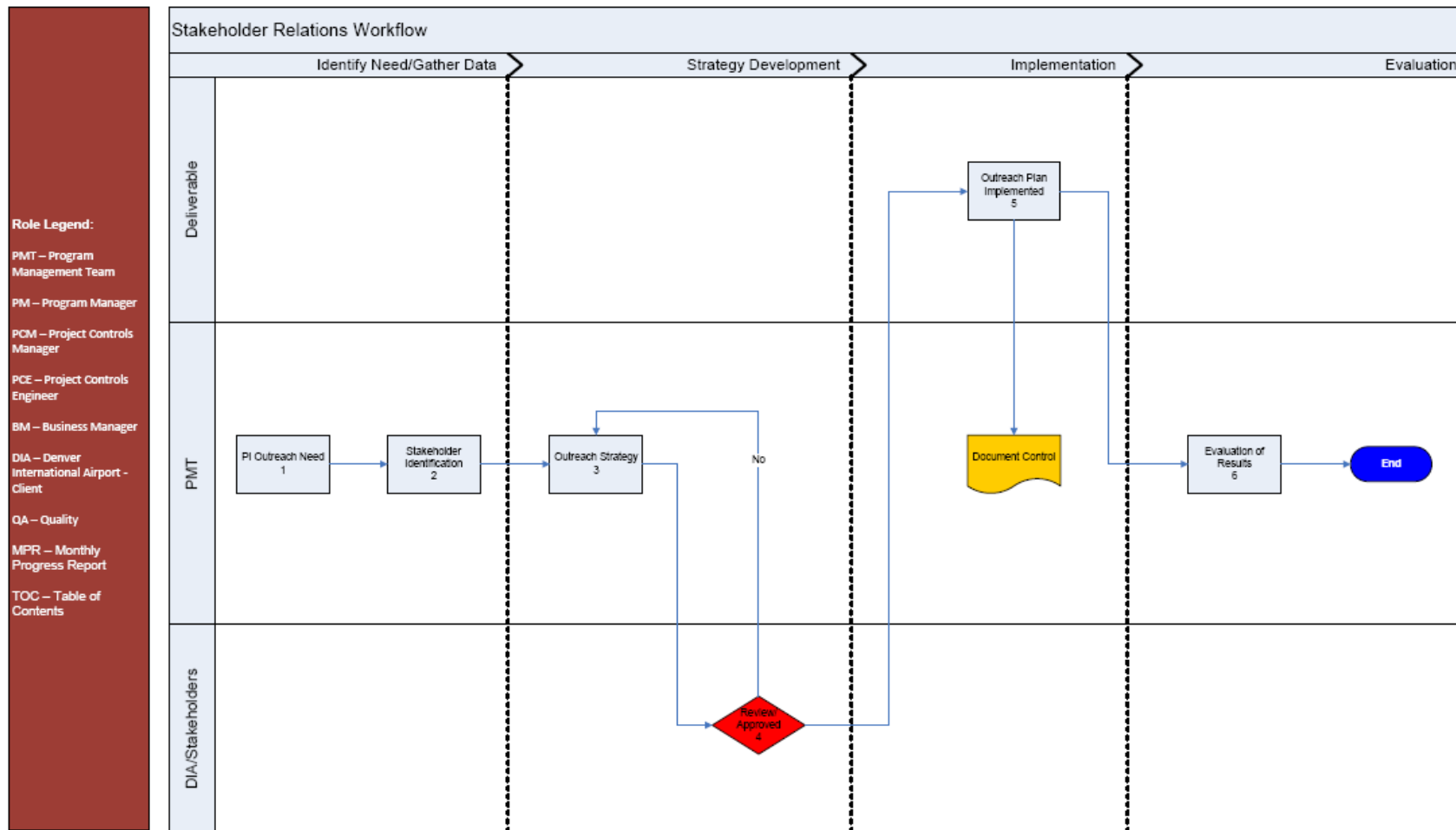
1. The following definitions and terms are provided in this policy as determined by OSHA.
  - a. Acclimatization - Temporary adaptation of the body to the work to be performed in excessive heat that occurs gradually when a person is exposed to it. Acclimatization peaks in most people within four to fourteen days of regular work for at least two hours per day in the heat.
  - b. Environmental risk factors for heat illness - Working conditions that create the possibility that heat illness could occur, including air temperature, relative humidity, and radiant heat from the sun and other sources; conductive heat sources such as the ground, air movement, workload severity and duration, protective clothing and personal protective equipment worn by employees.
  - c. Heat cramps – Painful intermittent spasms of the voluntary muscles following hard physical labor in a hot environment. Cramps usually occur after heavy sweating and often begin at the end of a work shift.
  - d. Heat exhaustion – Profuse sweating, weakness, rapid pulse, dizziness, nausea, and headache. The skin is cool and sometimes pale and clammy with sweat. Body temperature is normal or subnormal. Nausea, vomiting and unconsciousness may occur.
  - e. Heat Illness - A serious medical condition resulting from the body's inability to cope with a particular heat load and may include heat cramps, heat exhaustion, heat syncope and heat stroke.

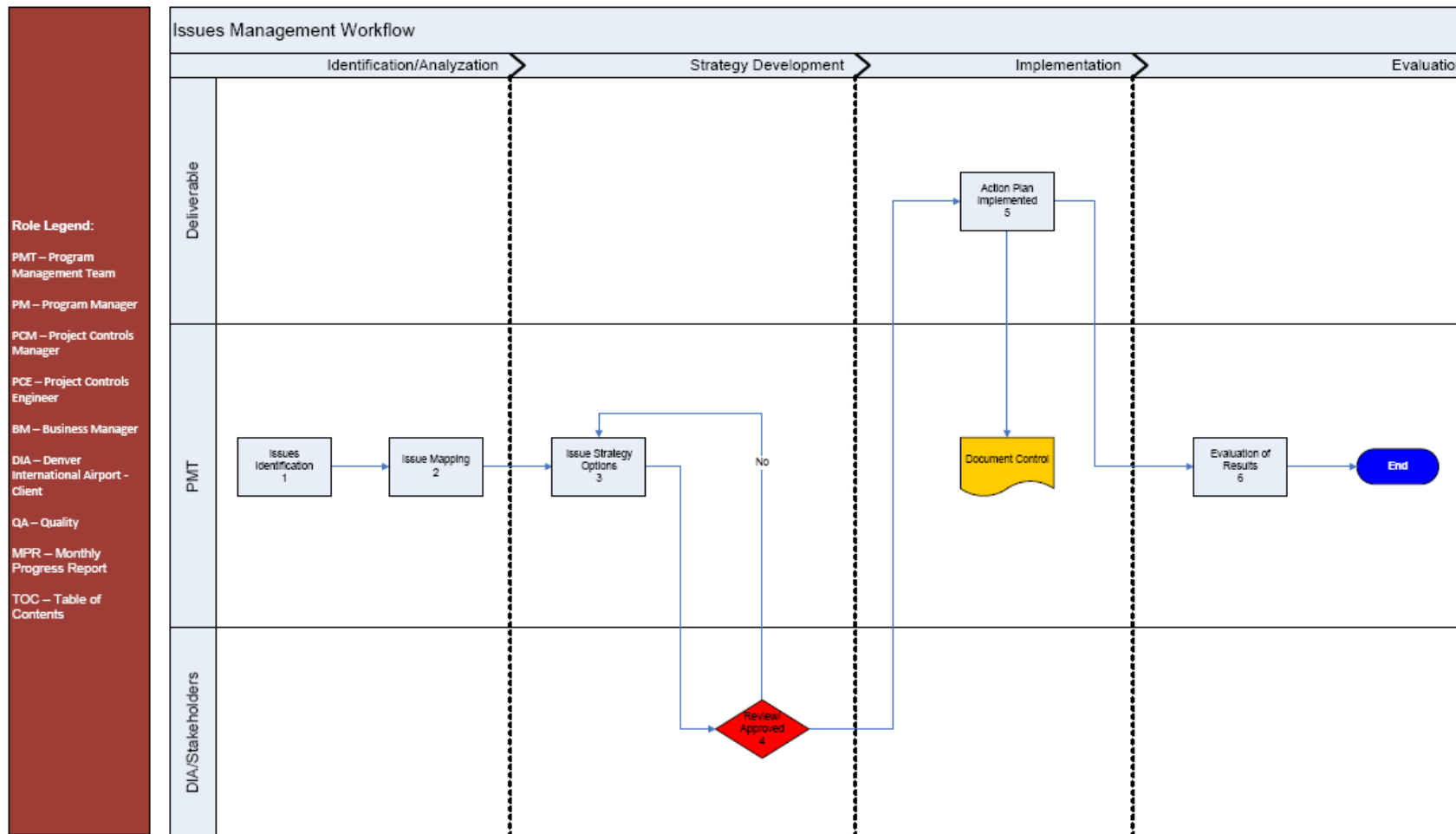
- f. Heat Stroke – Sweating is diminished or absent. The skin is hot, dry and flushed. Increased body temperature, which, if uncontrolled, may lead to delirium, convulsions, coma and death. Medical care is urgently needed.
- g. Personal risk factors for heat illness - Factors such as an individual's age, degree of acclimatization, health, water consumption, alcohol and caffeine consumption. Additional contributing factors are the use of prescribed medications that affect a body's fluid retention or other physiological responses to heat.
- h. Preventative recovery period - A period of time for recovery from heat to effectively prevent heat illness.
- i. Shade - The blocking of direct sunlight. Use of canopies, umbrellas and other temporary structures or devices may be used to provide shade. One indicator that blockage is sufficient is when objects do not cast a shadow in the area of blocked sunlight. Shade is not adequate when heat in the area of shade defeats the purpose of shade, which is intended to allow the body to cool. Avoid sources of shade such as metal sheds or parked cars/trucks that are sitting in the hot sun.
- j. Temperature - Unless otherwise noted, temperatures are rated at Fahrenheit

## APPENDIX K CRISIS COMMUNICATIONS WORKFLOW



UNEDITED





## APPENDIX L PROJECT SAFETY ORIENTATION TRAINING ACKNOWLEDGEMENT

|                                   |                                    |
|-----------------------------------|------------------------------------|
|                                   | Badge #:                           |
| Name of Employee:<br>(Print Name) | Date:                              |
| Company:                          | Person Conducting the Orientation: |

The following topics are to be reviewed with all employees during their initial site orientation.

### Topics

1. Information to acquaint the employee with special safety requirements of the work site, including security and traffic regulations;
2. Employer and employee rights and responsibilities
3. Description of the nature of the project;
4. Drug free work place and substance abuse testing
5. Accident reporting procedures;
6. How to report unsafe acts or conditions;
7. Site disciplinary procedures;
8. Personal protection equipment requirements;
9. Hazards prevalent for the work being performed (fall protection, trenching, ladder usage, scaffold safety, etc.); and
10. Hazard Communication Program
11. Emergency Evacuation Procedures
12. Good housekeeping practices
13. Job Hazard Analysis (JHA)
14. Pre Task Planning
15. Return to work programs, incident (to include near misses) reporting procedures, workers compensation requirements, and medical provider list.
16. Other \_\_\_\_\_

### Comments:

By signing this site orientation form, I hereby acknowledge that the basic site safety controls outlined above have been thoroughly reviewed with me and that I agree to obey by the contents of the site safety requirements.

\_\_\_\_\_  
Employee Signature

\_\_\_\_\_  
Date

Note: Any employee questions regarding the Safety Requirements shall be directed to the Contractor's Project Safety Representative.

☐ PM Session \_\_\_\_\_  
Presenter Initial when training is complete

☐ CMGC Session \_\_\_\_\_  
Presenter initial when training is complete



## APPENDIX M NEAR MISS REPORT FORM

### Near Miss Report Form

Near Miss Reporting is the process of identifying and preventing an unsafe act or condition before it causes an injury, illness or damage to property and equipment. This form is used to formally document the recognition of a hazard, the change that is made to prevent a reoccurrence of the hazard and to share the lessons learned with the contractors on the DIA OCIP.

All Information is required.

Contractor/Subcontractor Name: \_\_\_\_\_

**Fact Finding:** Please explain the following. (To be completed by employee)

Who was involved in the near miss (employee names optional): \_\_\_\_\_

Describe what happened: \_\_\_\_\_

\_\_\_\_\_

Where did the near miss occur: \_\_\_\_\_

When did the near miss occur: \_\_\_\_\_

How did the near miss occur: \_\_\_\_\_

\_\_\_\_\_

**Preventative Measures Taken.** (To be completed by Contractor's Safety Representative)

What acts or conditions led directly to the near miss incidents? \_\_\_\_\_

\_\_\_\_\_

What steps have/will be taken to prevent a similar incident? \_\_\_\_\_

\_\_\_\_\_

Who is responsible for taking these actions and following up to ensure that they are completed? \_\_\_\_\_

Expected completion date: \_\_\_\_\_ Actual completion date: \_\_\_\_\_

## APPENDIX N SAMPLE WEEKLY SAFETY TOOLBOX MEETING REPORT

# Weekly Safety Toolbox Meeting Report

Topics Discussed: \_\_\_\_\_

Date of Meeting: \_\_\_\_\_

Discussion Leader: \_\_\_\_\_

[illegible]

## APPENDIX O INVESTIGATION FORMS

### Employee Injury Investigation Form

|                                             |                                                 |                                                             |                                        |                                           |
|---------------------------------------------|-------------------------------------------------|-------------------------------------------------------------|----------------------------------------|-------------------------------------------|
| <b>1.</b> Injured Employee's Name           | <b>2.</b> Contractors Name                      | <b>3.</b> Date/Time of Injury                               | <b>4.</b> Supervisors/Foreman Name     | <b>5.</b> Specific Location of Injury     |
| <b>6.</b> Employee's Occupation             | <b>7.</b> Employee's Job Task at time of Injury |                                                             | <b>8.</b> Length of Service on Project | <b>9.</b> Length of Service with Employer |
| <b>10.</b> Description of what happened     |                                                 |                                                             |                                        |                                           |
| <b>11.</b> Part of Body Injured or Affected |                                                 |                                                             | <b>12.</b> Nature of Injury            |                                           |
| <b>13.</b> Severity                         | <input type="checkbox"/> First Aid              | <input type="checkbox"/> Medical treatment beyond first aid | <input type="checkbox"/> Lost workdays | <input type="checkbox"/> Fatality         |
| <input type="checkbox"/> Other: Specify     |                                                 |                                                             |                                        |                                           |
| <b>14.</b> Contributing Causes to Injury    |                                                 |                                                             |                                        |                                           |
| <b>15.</b> Root Cause of Injury             |                                                 |                                                             |                                        |                                           |

|                                                                                                   |                                               |                                                                                 |                               |                                    |                                                                     |                                             |                                |
|---------------------------------------------------------------------------------------------------|-----------------------------------------------|---------------------------------------------------------------------------------|-------------------------------|------------------------------------|---------------------------------------------------------------------|---------------------------------------------|--------------------------------|
| <b>16. Probable Recurrence</b>                                                                    | <input type="checkbox"/> Frequent             | <input type="checkbox"/> Occasional                                             | <input type="checkbox"/> Rare | <b>17. Loss Severity Potential</b> | <input type="checkbox"/> Major                                      | <input type="checkbox"/> Serious            | <input type="checkbox"/> Minor |
| <b>18. Preventive Measures</b>                                                                    |                                               |                                                                                 |                               |                                    |                                                                     |                                             |                                |
| <b>19. Injured employee's description of what happened (attach sheet for additional comments)</b> |                                               |                                                                                 |                               |                                    |                                                                     |                                             |                                |
| <b>20. Witness names and description of incident (attach sheet for additional comments)</b>       |                                               |                                                                                 |                               |                                    |                                                                     |                                             |                                |
| <b>21. Supervisors description of incident (attach sheet for additional comments)</b>             |                                               |                                                                                 |                               |                                    |                                                                     |                                             |                                |
| <b>22. Specific corrective actions or preventative measures taken</b>                             |                                               |                                                                                 |                               |                                    |                                                                     |                                             |                                |
| Corrective action taken                                                                           |                                               |                                                                                 |                               | Person responsible                 | Target completion date                                              | Date completed                              |                                |
|                                                                                                   |                                               |                                                                                 |                               |                                    |                                                                     |                                             |                                |
|                                                                                                   |                                               |                                                                                 |                               |                                    |                                                                     |                                             |                                |
|                                                                                                   |                                               |                                                                                 |                               |                                    |                                                                     |                                             |                                |
|                                                                                                   |                                               |                                                                                 |                               |                                    |                                                                     |                                             |                                |
|                                                                                                   |                                               |                                                                                 |                               |                                    |                                                                     |                                             |                                |
| <b>23. Attached supporting documentation (required)</b>                                           |                                               |                                                                                 |                               |                                    |                                                                     |                                             |                                |
| <input type="checkbox"/> Photos                                                                   | <input type="checkbox"/> Diagram of work area | <input type="checkbox"/> Applicable training documentation for parties involved |                               |                                    | <input type="checkbox"/> Contractor's investigation report          | <input type="checkbox"/> Witness statements |                                |
| <input type="checkbox"/> JHA (if applicable)                                                      |                                               | <input type="checkbox"/> Daily Pre-Task Planning Sheet                          |                               |                                    | <input type="checkbox"/> Corrective action supporting documentation |                                             |                                |

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 Supervisor's Signature

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 Safety Representative's Signature

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 Project Manager's Signature

## Builders' Risk/General Liability Investigation Form

|                                           |                                   |                                     |                                    |
|-------------------------------------------|-----------------------------------|-------------------------------------|------------------------------------|
| <b>1.</b> Names of parties involved       | <b>2.</b> Contractors Name        | <b>3.</b> Date/Time of Injury       | <b>4.</b> Supervisors/Foreman Name |
| <b>5.</b> Description of incident         |                                   |                                     |                                    |
| <b>6.</b> Description of damages          |                                   |                                     |                                    |
| <b>7.</b> Contributing causes to incident |                                   |                                     |                                    |
| <b>8.</b> Root cause of incident          |                                   |                                     |                                    |
| <b>9.</b> Probable Recurrence             | <input type="checkbox"/> Frequent | <input type="checkbox"/> Occasional | <input type="checkbox"/> Rare      |
| <b>10.</b> Loss Severity Potential        | <input type="checkbox"/> Major    | <input type="checkbox"/> Serious    | <input type="checkbox"/> Minor     |
| <b>11.</b> Preventive Measures            |                                   |                                     |                                    |

**12.** Employee's description of what happened (attach sheet for additional comments)

**13.** Witness names and description of incident (attach sheet for additional comments)

**14.** Supervisors description of incident (attach sheet for additional comments)

**15.** Specific corrective actions or preventative measures taken

| Corrective action taken | Person responsible | Target completion date | Date completed |
|-------------------------|--------------------|------------------------|----------------|
|                         |                    |                        |                |
|                         |                    |                        |                |
|                         |                    |                        |                |
|                         |                    |                        |                |
|                         |                    |                        |                |
|                         |                    |                        |                |

**16.** Attached supporting documentation (required)

|                                              |                                                        |                                                                                 |                                                            |                                             |
|----------------------------------------------|--------------------------------------------------------|---------------------------------------------------------------------------------|------------------------------------------------------------|---------------------------------------------|
| <input type="checkbox"/> Photos              | <input type="checkbox"/> Diagram of work area          | <input type="checkbox"/> Applicable training documentation for parties involved | <input type="checkbox"/> Contractor's investigation report | <input type="checkbox"/> Witness statements |
| <input type="checkbox"/> JHA (if applicable) | <input type="checkbox"/> Daily Pre-Task Planning Sheet | <input type="checkbox"/> Corrective action supporting documentation             |                                                            |                                             |

\_\_\_\_\_  
Supervisor's Signature

\_\_\_\_\_  
Safety Representative's Signature

\_\_\_\_\_  
Project Manager's Signature

## APPENDIX P     SAMPLE HOT WORK PERMIT

### Hot Work Permit

Authorization: The information on this permit has been evaluated, the site has been examined, and all safety measures are in place.

Signed: \_\_\_\_\_  
(Qualified Person Authorizing Hot Work Permit)

Date: \_\_\_\_\_

Location: \_\_\_\_\_

Description of hot work: \_\_\_\_\_

Authorized workers: \_\_\_\_\_  
\_\_\_\_\_

Is a fire watch required?

- ☐ Yes  
☐ No

Name of Fire Watch \_\_\_\_\_

A Fire Watch will be posted if:

- Flammable and combustible materials cannot be moved 35' from the point of operation
- Wall or floor openings within the immediate work area expose combustible materials in adjacent areas, including concealed spaces in walls or floors
- Combustible materials are adjacent to the opposite side of partitions, walls, ceilings or roofs, and are likely to be ignited

Permit Checklist

- ☐ Flammable and combustible materials within 35' of the point of operation have been removed, covered with fire retardant tarps, or otherwise shielded
- ☐ All floors and surfaces have been swept free of combustible dust or debris
- ☐ Any openings or cracks in the walls, floors, or ducts that are potential travel passages for sparks, heat and flames have been covered.
- ☐ An operable fire extinguisher is nearby and accessible
- ☐ Sprinkler heads that could be activated by hot work have been covered by a wet rag
- ☐ Smoke detectors in the area of hot work have been covered to prevent false alarms
- ☐ A Fire Watch has been posted, if required, during the hot work operation and for 30 minutes afterwards to verify that there are no live embers, sparks, or smoldering fires.

## **APPENDIX Q LESSONS LEARNED FORM**

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### **Lessons Learned Communication**

Date:

What:

When:

Where:

Incident Summary:

Discussion of Activities:

Analysis of What Went Wrong:

Immediate and System Cause:

Resolutions and Recommendations

Cost Savings/Avoidance

Work Function:

Hazards:

Originator:

Telephone:

Email:

Contact:

Telephone:

Email:

Distribution:



## APPENDIX R     CONTRACTOR'S MONTHLY SAFETY REPORT

### Contractor's Monthly Safety Report

(Due 1<sup>st</sup> Tuesday of each month)

Contractor Name: \_\_\_\_\_

Contract Number: \_\_\_\_\_

Data for Month/Year of: \_\_\_\_\_

| INCIDENT TYPES<br><i>(Includes all subcontractors)</i>                                                                    | Number of Cases/Claims |              |                 | Project Goal | Rates                      |                     |                        |
|---------------------------------------------------------------------------------------------------------------------------|------------------------|--------------|-----------------|--------------|----------------------------|---------------------|------------------------|
|                                                                                                                           | Current Month          | Year to Date | Project to Date |              | National Average           | Year to Date        | Total Project          |
| OSHA Recordable Incidents                                                                                                 |                        |              |                 |              | 4.3                        |                     |                        |
| Lost Workday Incidents                                                                                                    |                        |              |                 |              | 1.6                        |                     |                        |
| DART Incidents                                                                                                            |                        |              |                 |              | 2.3                        |                     |                        |
| First Aid Incidents                                                                                                       |                        |              |                 |              | 2009 BLS Construction Data |                     |                        |
| Near Misses Reported                                                                                                      |                        |              |                 |              |                            |                     |                        |
| General Liability                                                                                                         |                        |              |                 |              |                            |                     |                        |
| Builders Risk                                                                                                             |                        |              |                 |              |                            |                     |                        |
| <b>OSHA RECORDABLE AND FIRST AID INCIDENTS:</b><br><i>Please classify below and also complete on page 2 with details:</i> |                        |              |                 |              | <b>Current Month</b>       | <b>Year to Date</b> | <b>Project to Date</b> |
| Fall (e.g., floors, platforms, roofs)                                                                                     |                        |              |                 |              |                            |                     |                        |
| Struck by (e.g., falling objects, vehicles, equipment)                                                                    |                        |              |                 |              |                            |                     |                        |
| Caught in/between (e.g., cave-ins, unguarded machinery, equipment)                                                        |                        |              |                 |              |                            |                     |                        |
| Electrical (e.g., overhead power lines, power tools/cords, outlets, wiring)                                               |                        |              |                 |              |                            |                     |                        |
| Other (e.g., cuts, burns, and other items not covered above)                                                              |                        |              |                 |              |                            |                     |                        |
| <b>EMPLOYMENT INFORMATION</b><br><i>(Includes all subcontractors)</i>                                                     |                        |              |                 |              |                            |                     |                        |
| Average Daily Number of Employee's (FTE's)                                                                                |                        |              |                 |              |                            |                     |                        |
| Total Hours Worked by Employees                                                                                           |                        |              |                 |              |                            |                     |                        |
| <b>PROJECT SAFETY ACTIVITIES</b>                                                                                          |                        |              |                 |              |                            |                     |                        |
| Safety Orientations Completed                                                                                             |                        |              |                 |              |                            |                     |                        |
| Tool Box Meetings Completed                                                                                               |                        |              |                 |              |                            |                     |                        |
| Disciplinary Actions                                                                                                      |                        |              |                 |              |                            |                     |                        |
| Number of Site Safety Inspections Completed                                                                               |                        |              |                 |              |                            |                     |                        |
| Number of Supervisors/Foreman Participating in Site Safety Inspections                                                    |                        |              |                 |              |                            |                     |                        |

\_\_\_\_\_  
Contractor Project Director/Manager     Date

\_\_\_\_\_  
Contractor Site Safety Representative     Date

**DETAILS OF RECORDABLE AND FIRST AID INJURIES OR ILLNESSES FOR CURRENT MONTH:** *For all injuries and illnesses listed on page 1.*

| Date | Job Title/Craft | Brief Description | Corrective Actions Initiated |
|------|-----------------|-------------------|------------------------------|
|      |                 |                   |                              |
|      |                 |                   |                              |
|      |                 |                   |                              |
|      |                 |                   |                              |

**DETAILS OF GENERAL LIABILITY CLAIMS FOR CURRENT MONTH:** *For all general liability claims listed on page 1*

| Date | Brief Description | Corrective Actions Initiated |
|------|-------------------|------------------------------|
|      |                   |                              |
|      |                   |                              |

**DETAILS OF BUILDERS RISK CLAIMS FOR CURRENT MONTH:** *For all builders risk claims listed on page 1*

| Date | Brief Description | Corrective Actions Initiated |
|------|-------------------|------------------------------|
|      |                   |                              |
|      |                   |                              |



## ***APPENDIX S DESIGNATED PROVIDER LIST***

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**NOTICE TO ALL EMPLOYEES**

**If you become injured on the job...**

**Take the following steps:**

- **Notify a member of Management of your injury immediately.**
- **If you feel that you need medical attention, the providers listed are available for treatment.**
- **Please call the provider to schedule an appointment.**
- **For urgent care needs OR after clinic hours, you may seek treatment from the hospital Emergency Department listed OR the nearest qualified facility or provider.**
- **Patients will be seen on a medical priority basis.**

**City and County Of Denver,  
Department of Aviation DIA-OCIP  
South Terminal Redevelopment Project**

Occ Med Colorado, LLC  
3449 Chambers Road, Ste B.  
Aurora, CO 80111  
720-859-6139  
Estimated Distance 13.86 mile(s)  
Occupational Medicine

Concentra Medical Center  
3350 Peoria  
Aurora, CO 80011  
303-340-3053  
Estimated Distance 16.11 mile(s)  
Occupational Medicine

University Of Colorado  
1635 Aurora Ct.  
Aurora, CO 80045  
720-848-1060  
Estimated Distance 17.34 mile(s)  
Hospital

9/23/2011

## APPENDIX T DRUG TESTING AND MEDICAL TREATMENT AUTHORIZATION FORM FOR OCCMED COLORADO, LLC AND CONCENTRA



P.O. Box 31129 • Aurora, CO 80041

**DIA STRP AUTHORIZATION FORM:**  
3449 B. Chambers Rd., Aurora, CO 80011  
PH: 720-859-6139 Fax: 720-859-3294

Patient's Name: \_\_\_\_\_

Employer/Contractor: \_\_\_\_\_ Phone: \_\_\_\_\_

Contractor Code: \_\_\_\_\_

Employer/Contractor Address: \_\_\_\_\_

Employer/Contractor Email: \_\_\_\_\_

**Below Services Authorized by:** \_\_\_\_\_

**Date:** \_\_\_\_\_ **Title/phone:** \_\_\_\_\_

### PRE-EMPLOYMENT

- ☐ History & Physical – Bill Requesting Party
- ☐ 10 Panel Rapid Drug Screen – Bill to AJG
- ☐ Other: \_\_\_\_\_

### POST ACCIDENT

- ☐ 10 panel Rapid Drug Screen – Bill to Subcontractor
- ☐ Injury Treatment – Bill to Sedgwick CMS
- ☐ Other: \_\_\_\_\_

### REASONABLE SUSPICION – Bill Subcontractor NOT PROJECT

- ☐ 10 Panel Rapid Drug Screen
- ☐ Breathalyzer
- ☐ Other: \_\_\_\_\_

### INJURY TREATMENT – Bill Sedgwick CMS

Date of Injury: \_\_\_\_\_

Part of body injured: \_\_\_\_\_

DOT Reportable Injury:      Yes: \_\_\_\_\_      No: \_\_\_\_\_

NOTES: \_\_\_\_\_

**\*\*Project Manager: Jason Jeffries PH: 303-542-7183**  
Jason.Jeffries@parsons.com



**DIA STRP AUTHORIZATION FORM:**  
**3350 Peoria, Ste. 190 Aurora, CO 80010**  
**PH: 303-340-3053 FX: 303-340-3862**

**Select Project**

- ☐ STRP/Enabling Utilities-8200
- ☐ STRP/Foundations & Public Trans-8300
- ☐ STRP/Hotel-8400
- ☐ STRP/Roadways-8500
- ☐ STRP/Inside Utilities-8600

Patient's Name: \_\_\_\_\_

Employer/Contractor: \_\_\_\_\_ Phone: \_\_\_\_\_

Contractor Code: \_\_\_\_\_

Employer/Contractor Address: \_\_\_\_\_

Employer/Contractor Email: \_\_\_\_\_

Below Services Authorized by: \_\_\_\_\_

Date: \_\_\_\_\_ Title/phone: \_\_\_\_\_

**POST ACCIDENT**

- ☐ 10 panel Rapid Drug Screen – Bill to Subcontractor
- ☐ Injury Treatment – Bill to Sedgwick CMS
- ☐ Other: \_\_\_\_\_

**REASONABLE SUSPICION – Bill Subcontractor NOT PROJECT**

- ☐ 10 Panel Rapid Drug Screen
- ☐ Breathalyzer
- ☐ Other: \_\_\_\_\_

**INJURY TREATMENT – Bill Sedgwick CMS**

Date of Injury: \_\_\_\_\_

Part of body injured: \_\_\_\_\_

DOT Reportable Injury: Yes: \_\_\_\_\_ No: \_\_\_\_\_

NOTES: \_\_\_\_\_

**\*\*Project Manager: Jason Jeffries PH: 303-542-7183**

Jason.Jeffries@parsons.com